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DECEMBER, 1950

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Du Pont THIONEX-MBTS Acceleration is best for "Cold Rubber" Treads

Thionex-MBTS acceleration gives you more for your money in cold rubber treads containing fine furnace blacks. Here are the advantages found by tire manufacturers in tests comparing Thionex-MBTS combinations with their regular-production accelerator.

TREAD WEAR—Tests proved that the treads of tires containing Thionex-MBTS combinations wore fully as well as the treads of the control tires.

TREAD CRACKING—Treads accelerated with Thionex-MBTS showed no evidence of crack growth during test runs as long as 43,000 miles.

PROCESSING SAFETY—Actual factory processing experience showed that stocks accelerated with Thionex-MBTS have little or no tendency to scorch. Mooney scorch times of about 30 minutes are typical of "cold rubber" tread compounds containing Thionex-MBTS accelerator.

STORAGE STABILITY—Unlike compounds containing some types of accelerators, stocks containing Thionex-MBTS acceleration do not lose curing strength nor do they "set up" even after prolonged storage.

COST—The use of Thionex-MBTS acceleration saved money . . . was **40-50% lower in cost than their regular-production accelerators.**

● For complete information on Thionex-MBTS acceleration see Report BL-235 or ask your Du Pont representative. E. I. du Pont de Nemours & Co. (Inc.), Rubber Chemicals Division, Wilmington 98, Delaware.

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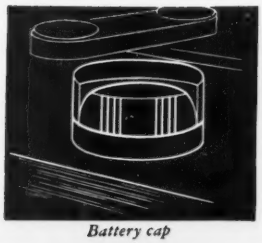
News about

B. F. Goodrich Chemical Company ***materials***

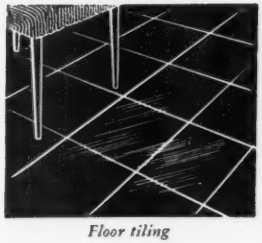


Battery cap

Drain board mat

Strainer for kitchen use

Shoe soling



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Short cut to savings on your rubber compounding!

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RESIN 50

THIS easy-processing, reinforcing agent can help you save *plenty* on rubber compounding costs. And give you improved, finished products, too.

Of first importance, Good-rite Resin 50 provides a new and simple approach to solving hardness problems. A typical example—it's a means of filling in the gap between soft rubber compounds and ebonites.

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Good-rite Resin 50 is made as a white, free-flowing powder. It can be compounded in a wide variety of attractive colors. Send for technical bulletins. Find out how Good-rite Resin 50 can help improve your rubber compounding *and* your cost-savings. Please address Dept. CA-6, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco.

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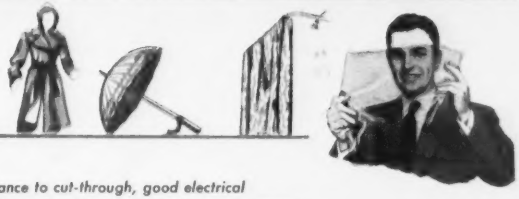
"Dry hand" and stitch-tear resistance makes Marvinol-based calendered sheets pleasant to touch, lasting, easy to work.

High physical properties and ease in processing, printing, embossing and heat-sealing are found in cast, calendered or extruded Marvinol-based films.



Resistance to cut-through, good electrical qualities and rapid extrusion rates are the extras Marvinol formulations offer extruders.

Sharply detailed Marvinol-based products are made by injection, low pressure, compression, slush and blow molding processes.

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MARVINOL vinyl resins put buy-appeal in your products from the start. For superior physicals, Marvinol VR-10. For ease in processing, plus good physicals, Marvinol VR-20. Both resins offer you stability under heat, light and time; dimensional stability; low temperature flexibility; resistance to abrasion, wear, tear, oils and acids. Let us show you how to use Marvinol's timesaving features. All technical information developed in our modern laboratories is at your disposal, since it is through you that Marvinol reaches the consumer. Write today for the latest technical information. Dept. R-12, NAUGATUCK CHEMICAL, Naugatuck, Connecticut. *In Canada*, Naugatuck Chemical, Elmira, Ontario.

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BANBURY MIXERS
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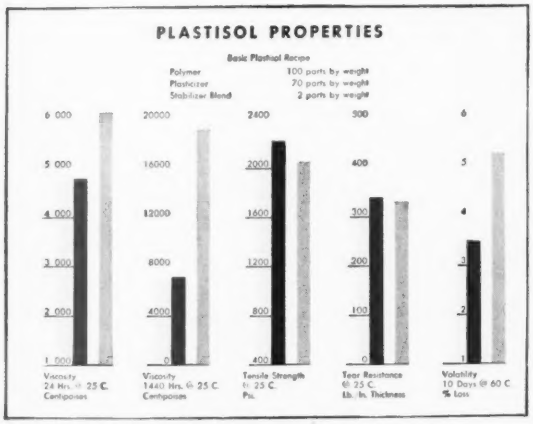
FB-640

HOW TO GET

IMPROVED QUALITY AND LOWER VISCOSITY PLASTISOLS WITH BARRETT* "ELASTEX" 10-P PLASTICIZER



Key: Black—"ELASTEX" 10-P Plasticizer; Grey—di-2-ethylhexyl phthalate

In the manufacture of plastisols for coating and low-pressure molding operations, compounders have long known the value of di-2-ethylhexyl phthalate as a primary plasticizer. Dispersions of vinyl resins in this plasticizer possess good storage stability, and are of moderately low viscosity. The coatings and molded articles produced from them exhibit good physical and performance characteristics.

Now Barrett offers the plastisol compounder an even more efficient dispersant—"ELASTEX" 10-P Plasticizer.

Plastisols prepared with this high quality primary plasticizer possess lower viscosity and better storage stability than do those compounded with equivalent amounts of di-2-ethylhexyl phthalate. At the same time, the fused products exhibit improved physical properties, and are subject to less volatile loss.

If you manufacture plastisols for spread coating, molding, or casting, the superior performance of Barrett "ELASTEX" 10-P Plasticizer is well worth investigating.

✓ **NOTE:** Technical advice on the use of BARRETT Chemicals is available to you through the assistance of Barrett representatives. Why not put your problem up to us? Phone, wire or write.

BARRETT* CHEMICALS AVAILABLE TO THE PLASTICS INDUSTRY

"ELASTEX" 10-P Plasticizer	Dibutyl Phthalate
"ELASTEX" 28-P Plasticizer	Phthalic Anhydride
"ELASTEX" 50-B* Plasticizer	Phenol
"ELASTEX" DCHP Plasticizer	Crystal Urea

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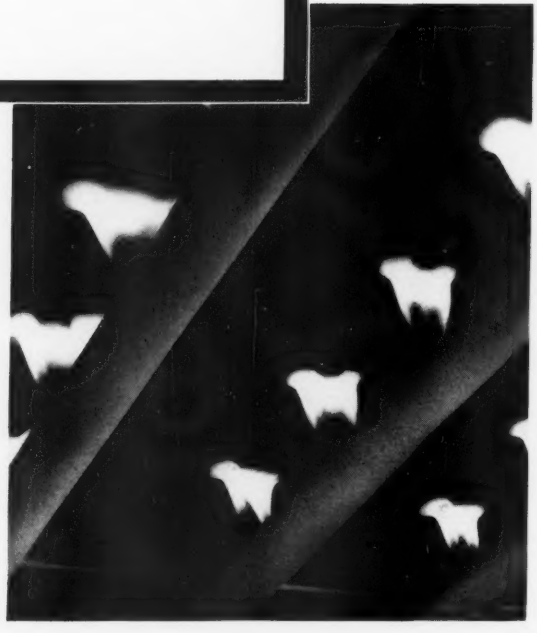

United channel blacks conform with your needs and with those of the times.

United channel blacks give matchless satisfaction with products in manufacture and in service.

United channel blacks represent real quality. They have a reputation for unsurpassed uniformity.

STANDARDIZE ON UNITED BLACKS THEY ABOUND IN ADVANTAGES

RESEARCH DIVISION

UNITED CARBON COMPANY, INC.

Charleston 27, West Virginia

Piccolyte PAGEANT

Pick Any One..

and you get them all

Even if you select only *pale color* as the Piccolyte virtue you want, you will find that the other inherent advantages of this versatile synethic resin provide many practical benefits. Stability, low-cost, compatibility with other materials, chemical inertness, petroleum-solubility are but a few of the features that you can use to improve your products and reduce your costs.

Piccolyte is economical, and easy to use. It is available in nine grades, from soft to hard, horny. Write for a generous test sample, and describe your application so that we can send a suitable grade.

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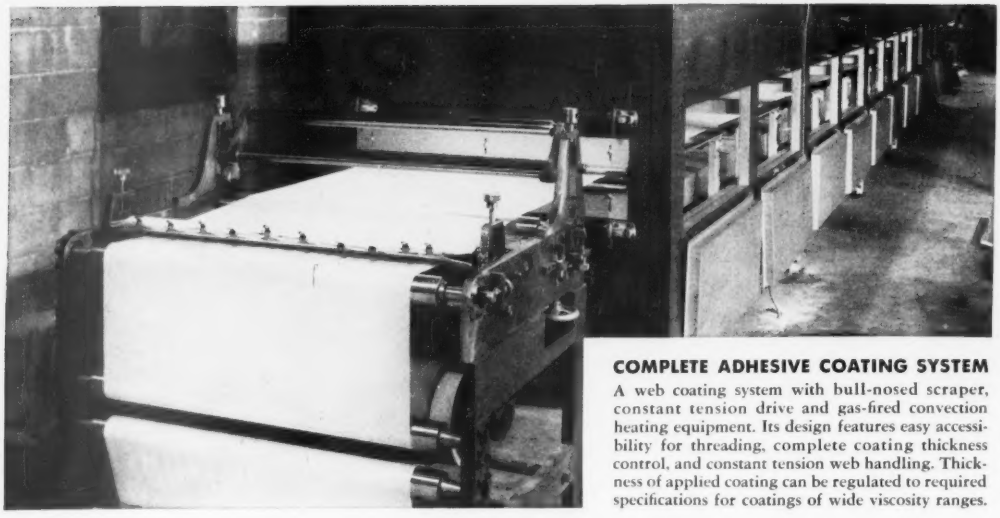
Clairton, Pennsylvania

Plants at Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.

Distributed by Harwick Standard Chemical Co., Akron 5, Ohio

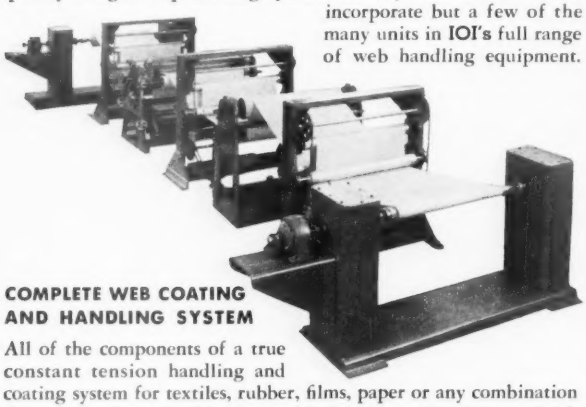


COMPLETE ADHESIVE COATING SYSTEM

A web coating system with bull-nosed scraper, constant tension drive and gas-fired convection heating equipment. Its design features easy accessibility for threading, complete coating thickness control, and constant tension web handling. Thickness of applied coating can be regulated to required specifications for coatings of wide viscosity ranges.

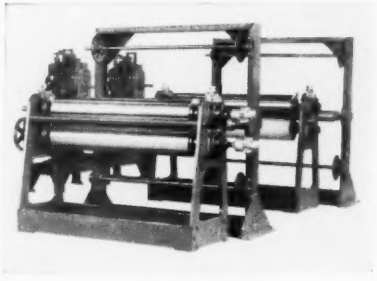
101 Coating and Processing Systems for TEXTILES...RUBBER...FILMS...PAPER

IN THE FIELD of coating and processing of web materials, textiles, rubber, films and paper, 101 has employed the principle of continuous operations with outstanding success, transforming various related but separately performed operations into completely integrated processing systems. The systems described here incorporate but a few of the many units in 101's full range of web handling equipment.



COMPLETE WEB COATING AND HANDLING SYSTEM

All of the components of a true constant tension handling and coating system for textiles, rubber, films, paper or any combination thereof, are shown in this photo with the evaporating oven omitted. This design features accurate tension control at the unwinding end, at the center, through the evaporating oven and at the final rewind stand. Tension ranges can be varied, as required, from light to heavy. Speeds can be accurately adjusted over a wide range.



FILM ATTENUATING AND TENSIONING SYSTEM

In the production of unsupported polyethylene sheeting, hot film tensions must be accurately maintained. As the formed film is produced this system propels it at medium to high speeds and attenuates it by means of variable speed drives and constant tension handling. Continuous operation, including continuous rewinding under constant tension, is a feature of the system.

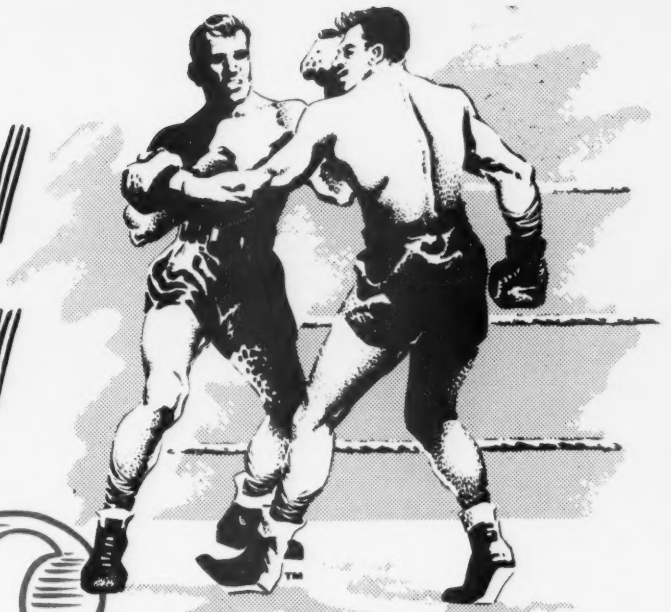
Write for 101 booklets, "Blueprint for Industry Part V, Coating and Handling Equipment for Textiles, Papers, Films, and Foils" and "The Handling of Webs and Monofilaments". An 101 engineer will be glad to call, on request, to discuss your specific production problems.

INDUSTRIAL 101 ENGINEERING VERSATILITY OVENS, INC.

13825 TRISKETT ROAD CLEVELAND 11, OHIO

pound for Pound

YOU CAN'T BEAT



Crystex

INSOLUBLE SULPHUR

Pound for pound, CRYSTEX contains more insoluble sulphur . . . it's guaranteed to be 85% insoluble in Carbon Bisulphide. When you compare the price of CRYSTEX in relation to this extremely high insoluble sulphur content, you'll find CRYSTEX to be less expensive. In fact, by this per unit comparison, CRYSTEX is the most economical insoluble sulphur on the market.

Let us send a generous testing sample and the very latest technical and use data on CRYSTEX Insoluble Sulphur.

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"DUTCH BOY" DYPHOS

Dibasic Lead Phosphite. The outstanding heat and light stabilizer for vinyl chloride polymers and copolymers. Dyphos is unexcelled in providing protection against the deleterious effects of *both* heat and light.

The remarkable effectiveness of Dyphos makes it possible to utilize chloroparaffins as low cost flame-resistant secondary plasticizers in quality products. Dyphos is also highly effective in plastisols and organosols.

TRADE NAME	CHEMICAL COMPOSITION	RECOMMENDED FOR USE IN
"Dutch Boy" Tribase	Tribasic Lead Sulphate	Electrical compounds
"Dutch Boy" Tribase E	Basic Lead Silicate Sulphate Complex	Low volume cost insulation
"Dutch Boy" DS-207	Dibasic Lead Stearate	Sheeting, extrusion and molded compounds, i.e., insulated wire and vinyl phonograph records
"Dutch Boy" Plumb-O-Sil A	Coprecipitate of Lead Orthosilicate and Silica Gel	Translucent and colored sheeting and upholstery stocks
"Dutch Boy" Plumb-O-Sil B	Coprecipitate of Lead Orthosilicate and Silica Gel	Translucent film and sheeting, belting
"Dutch Boy" Plumb-O-Sil B Electrical Grade	Coprecipitate of lead Orthosilicate and Silica Gel	Highgrade insulated wire and sheeting
"Dutch Boy" Dythal	Dibasic Lead Phthalate	General purpose stabilizer for heat and light
"Dutch Boy" Dyphos	Dibasic Lead Phosphite	Excellent for heat and light in all opaque stocks including Plastisols and Organosols
"Dutch Boy" Normasal	Normal Lead Salicylate	Vinyl flooring compounds. Rubber stocks as non-scorch activator

"DUTCH BOY" TRIBASE
Tribasic Lead Sulphate plus
"DUTCH BOY" DS-207
Dibasic Lead Stearate

The popular combination for good, all-around performance. Combines heat stability, light fastness and lubricity in processing.

"DUTCH BOY" DYTHAL

Dibasic Lead Phthalate. An excellent absorber of ultra-violet light, Dythal promotes light fastness in organic films. This advantage, combined with rugged heat stability derived from the basic character of this compound, makes Dythal the *general purpose stabilizer.*

Accelerated tests in the laboratory, plus outdoor exposure tests, show that Dyphos, Dythal, and Tribase — DS-207 greatly increase the useful life of plastic compounds.

For example, a compound containing Dyphos withstood over 2000 hours in the Weatherometer before failure.

"Dutch Boy" Stabilizers are a product of National Lead Company.

Our technical staff will help you stabilize vinyl resins for any use. Write for complete information.

Dutch Boy PRODUCTS

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CHEMICALS

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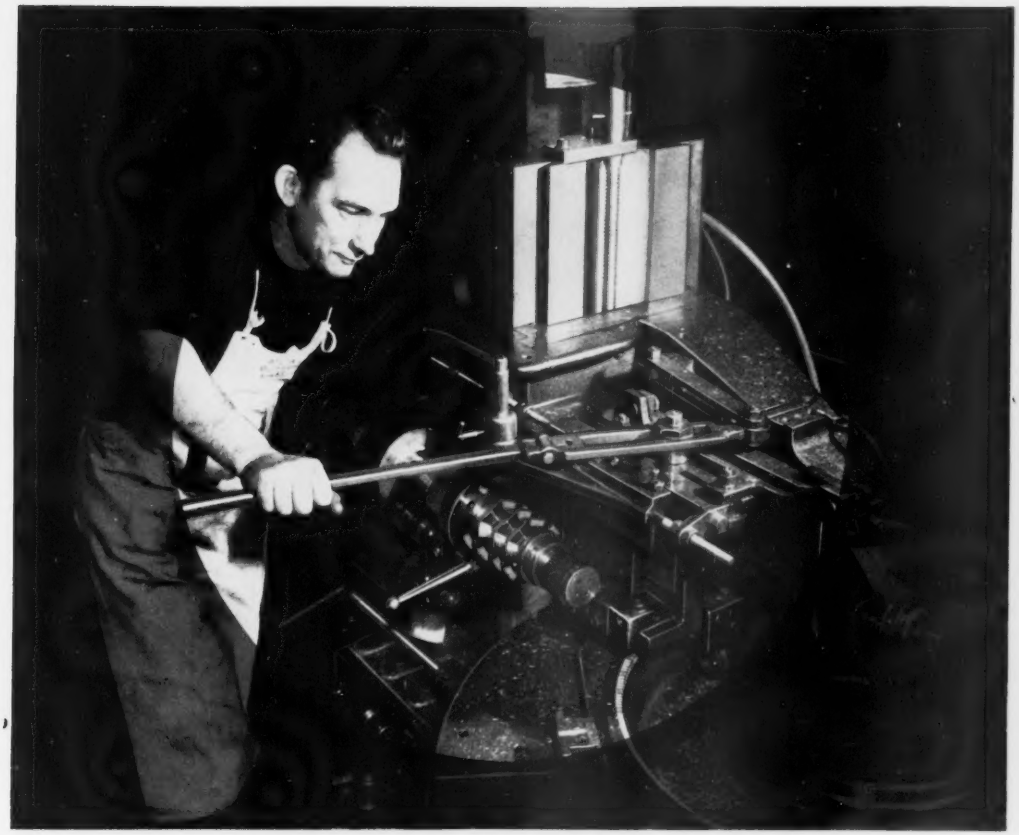

CHANCE PLAYS NO PART IN BRIDGWATER *Accuracy*

THE inherent quality built in a tire is visible only in its outward appearance and is a function of the accuracy of the tire mold. That is why leading manufacturers specify "molds by Bridgwater."

Tire molds by Bridgwater are known for their precise, sharp corners and the accurate template fit of all characters and ribs in the tire design.

Much of this precision can be attributed to the special mold engraving machines developed and patented by us, and used exclusively in our Athens and Akron plants.

These unique machines make possible absolute mechanical and mathematical faithfulness in duplication of the original design — and at the lowest possible cost.

THE BRIDGWATER MACHINE COMPANY

Akron, Ohio

FOR BETTER MOLDS FOR BETTER TIRES *SPECIFY* BRIDGWATER

Indispensable TO YOU IN THE RUBBER INDUSTRY—

Gives Your Products

PROTECTION and SALES APPEAL

at Little Cost!

BEACOFINISH—a unique family of coating materials conceived to give your products greater durability and eye appeal. These highly concentrated wax emulsions that can be diluted with up to four parts of water can be used with the utmost safety and economy.

BEACOFINISH is therefore of four-fold importance to you:—

1. ***It Protects*** your products against their natural enemies—air, sunlight, moisture and excessive handling.
2. ***It Improves*** the appearance of your product for its uniform coating stimulates greater consumer interest.
3. ***It's Economical*** because its high dilution potential (without losing efficiency) allows one gallon to cover 15,000 sq. ft.
4. ***It's Safe*** being a wax in water emulsion, it eliminates the fire and health hazards of volatile-solvent based finishes.

BEACOFINISH can be applied by dipping, sponging, spraying or brushing—dries in about 20 minutes—faster if force-dried—to give a hard protective coating of great elasticity.

BEACOFINISH may be ordered in Neutral or Black, in varying degrees of luster from brilliant to dull. It is so concentrated, from one drum you can obtain potentially up to five drums of superior coating for your products.

CONSULT US—WRITE US TODAY

Let us show you how BEACOFINISH can make your products more attractive and saleable—protect them from damage—you from loss—in production and transit!

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HI-SIL SILENE EF in GR-S

get these facts NOW

on changing-over from natural rubber compounds to GR-S —to prepare for increased restrictions

The reinforcing pigments in GR-S must be of considerably higher quality than required in natural rubber. In fact, only with top quality pigments can the properties of white or colored natural rubber compounds be approached in GR-S.

HI-SIL* and SILENE EF**—two exclusive Columbia products—offer the highest quality in non-black reinforcing pigments for partial or complete replacement. You may obtain information and working samples by writing Pittsburgh Plate Glass Company, Columbia Chemical Division, Fifth at Bellefield, Pittsburgh 13, Pa.

*Precipitated hydrated silicon dioxide

**Precipitated hydrated calcium silicate

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Compounding of GR-S with a New Fine Particle Silica. (Reprinted from India Rubber World, August, 1949.)

No. 47-7. Silene EF and Calcene T in GR-S 10.

No. 47-4. Comparison of Mixtures of Calcene T and Silene EF with other Fine Calcium Carbonates in GR-S at Medium and High Loadings.

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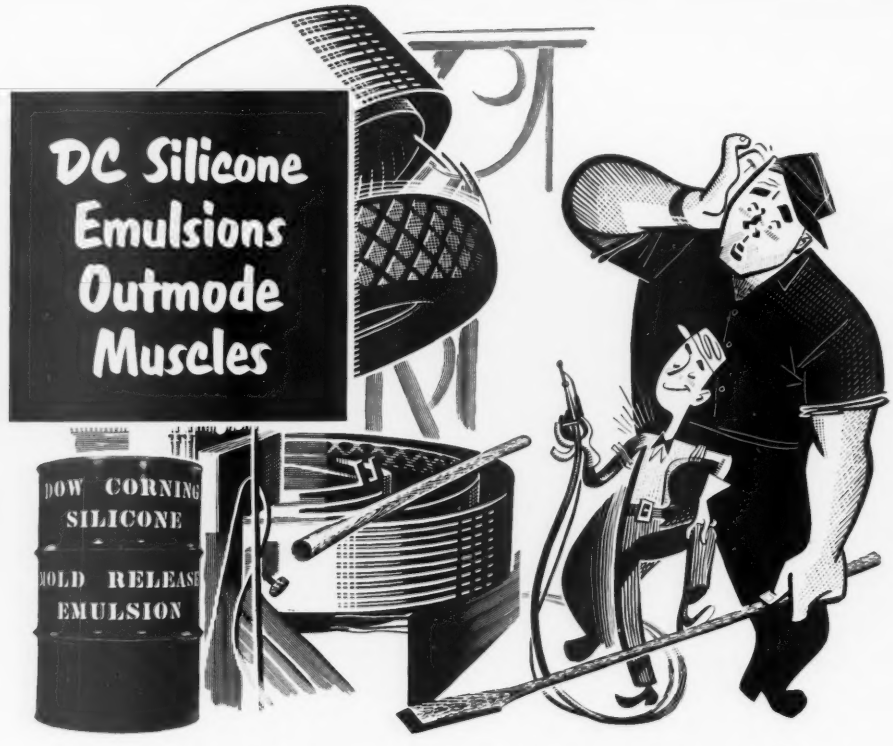

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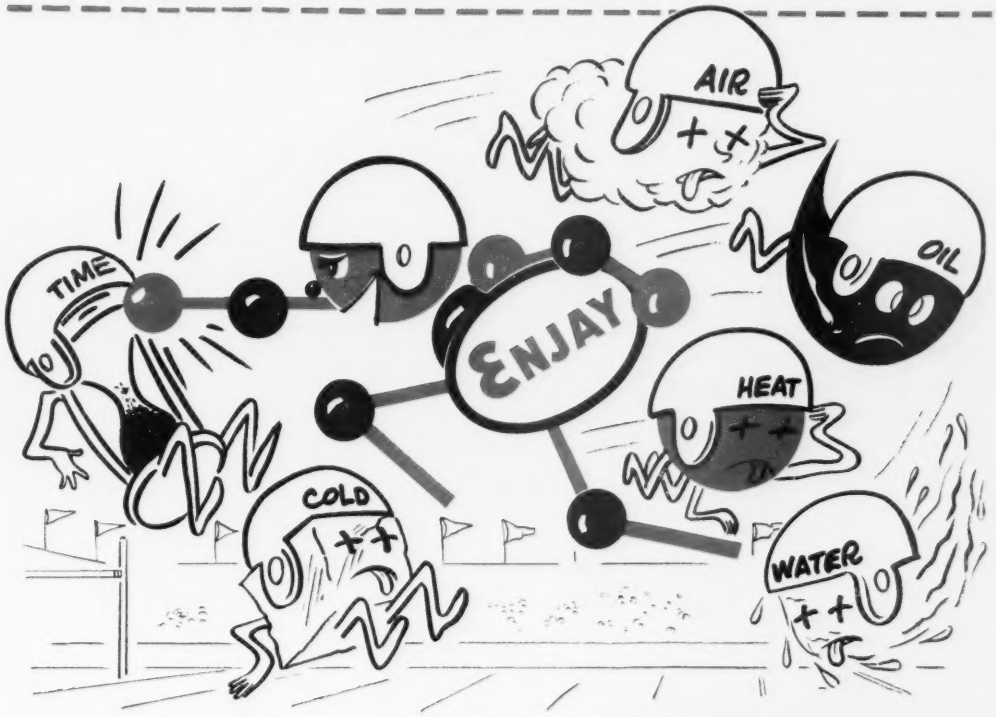

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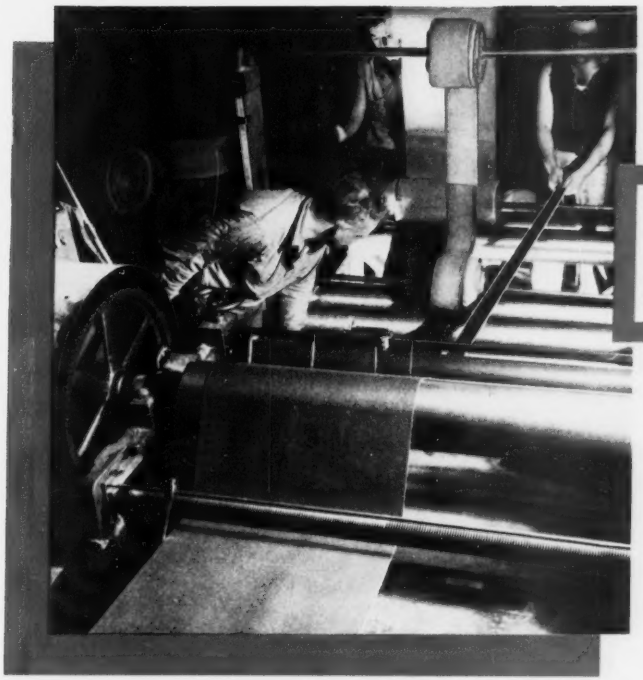

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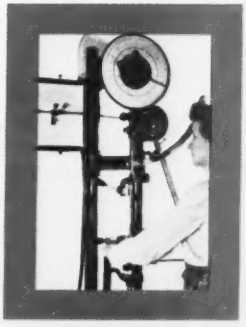

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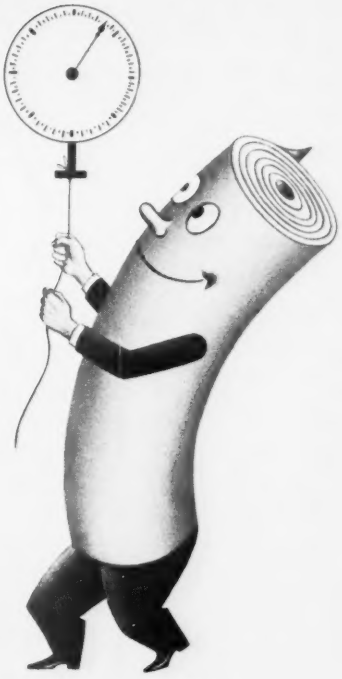

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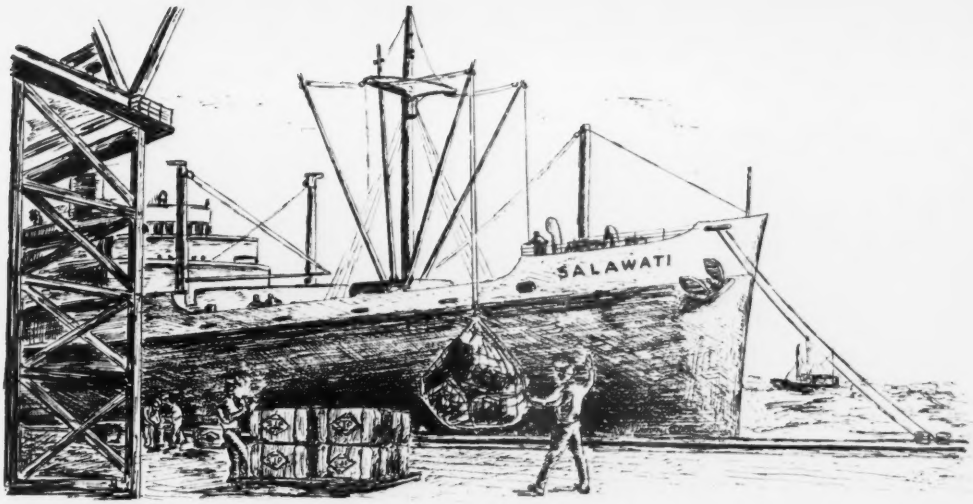

Rubber

Natural – Synthetic

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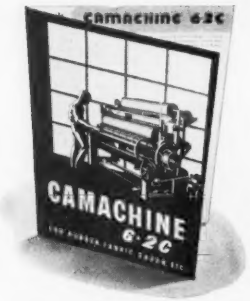

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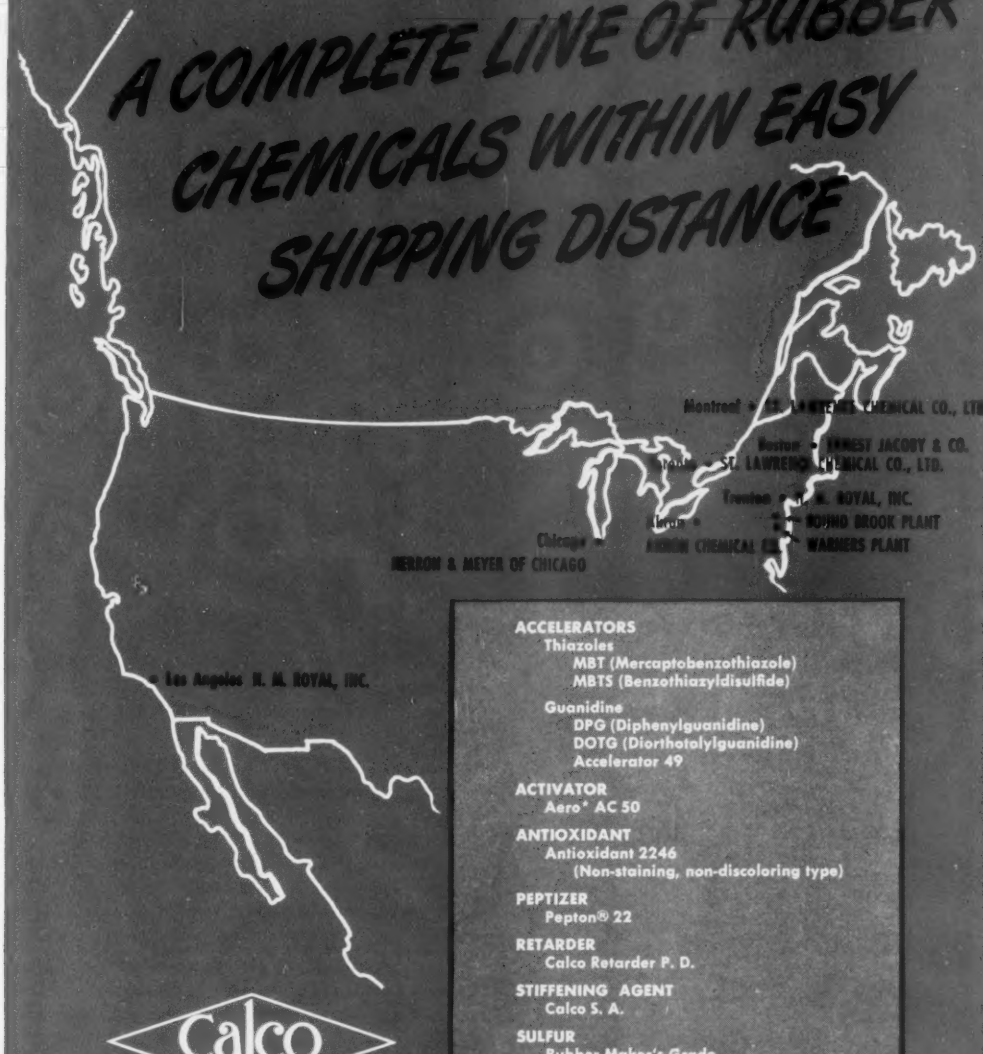

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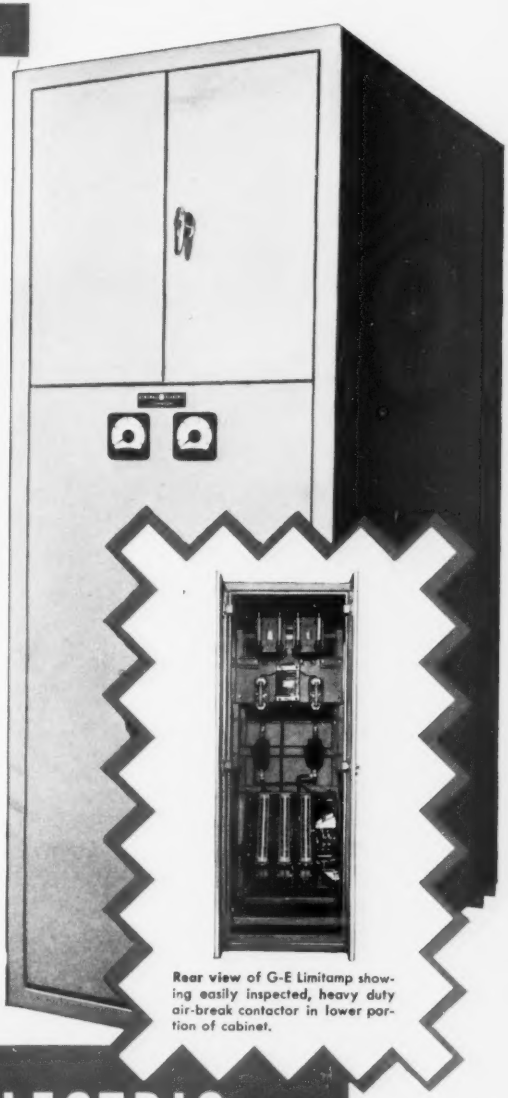

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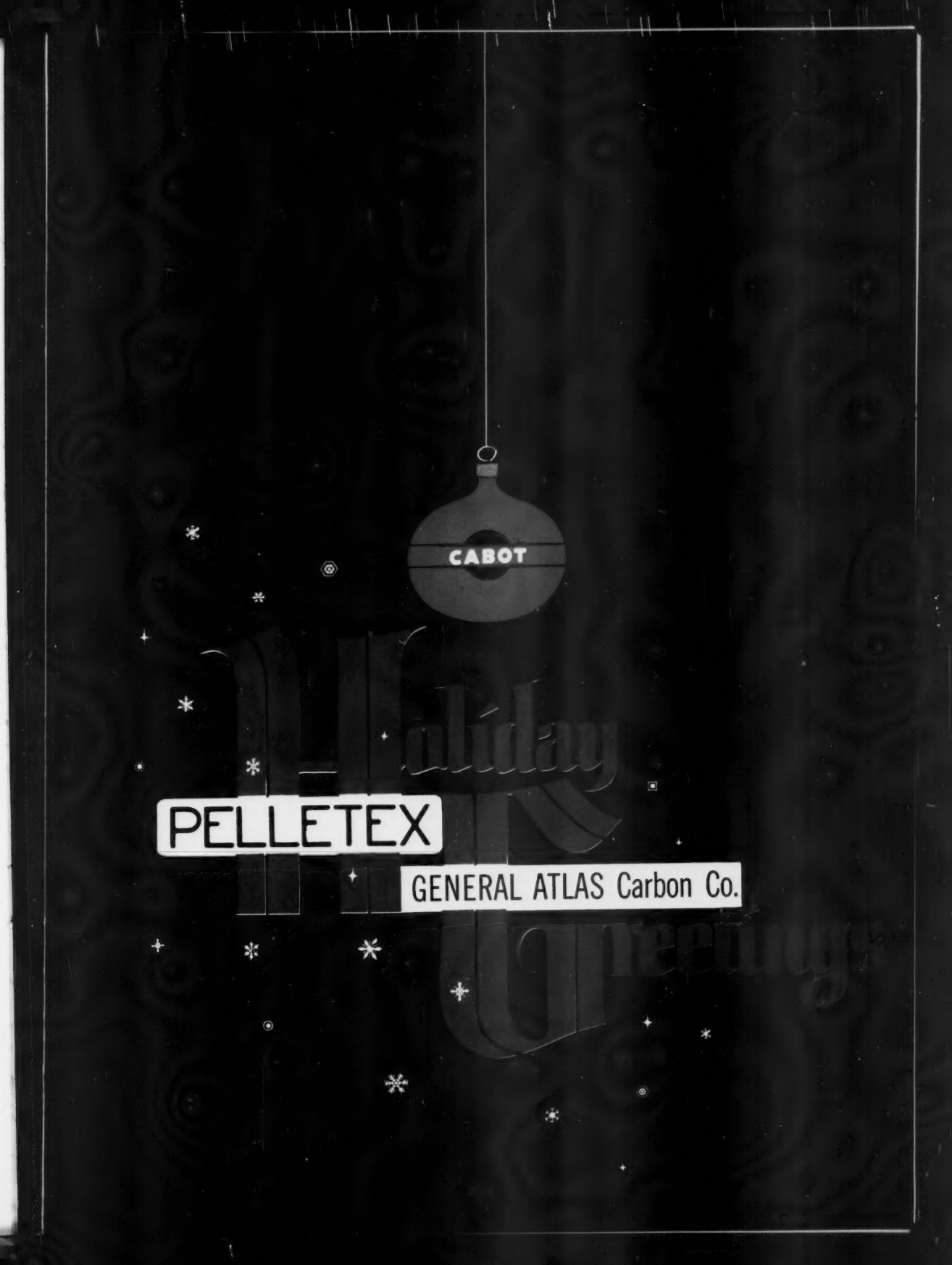
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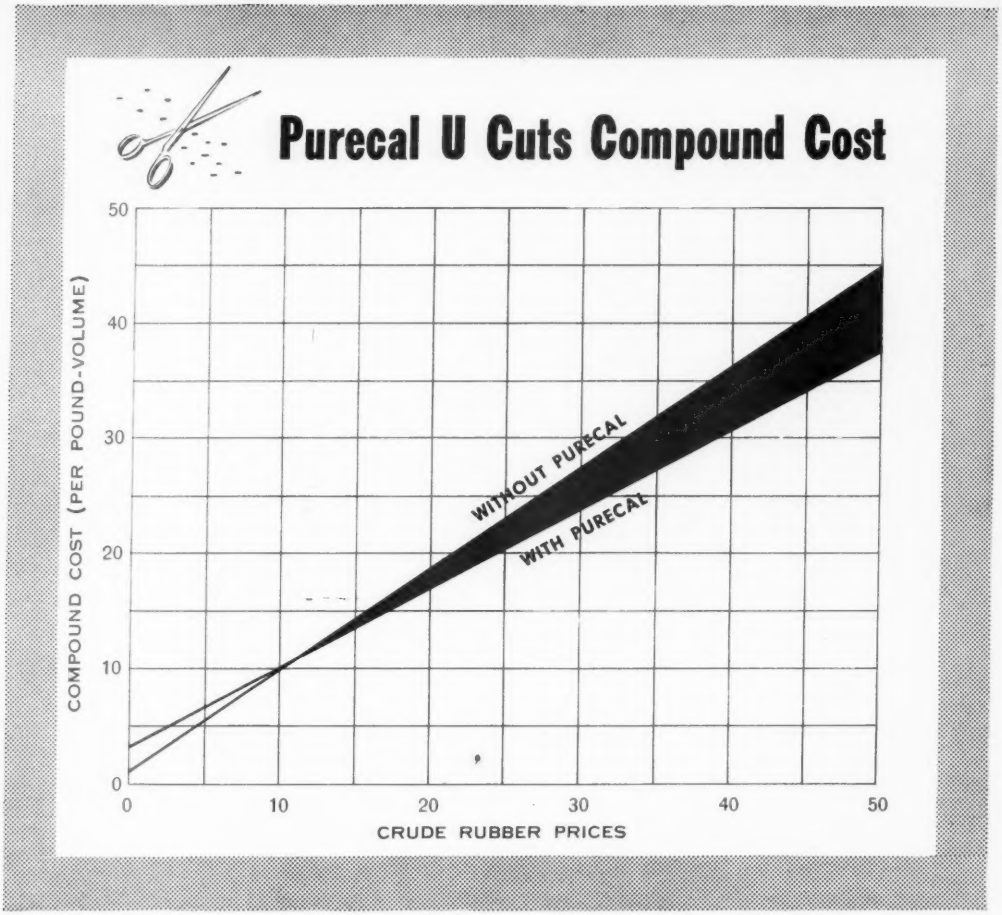

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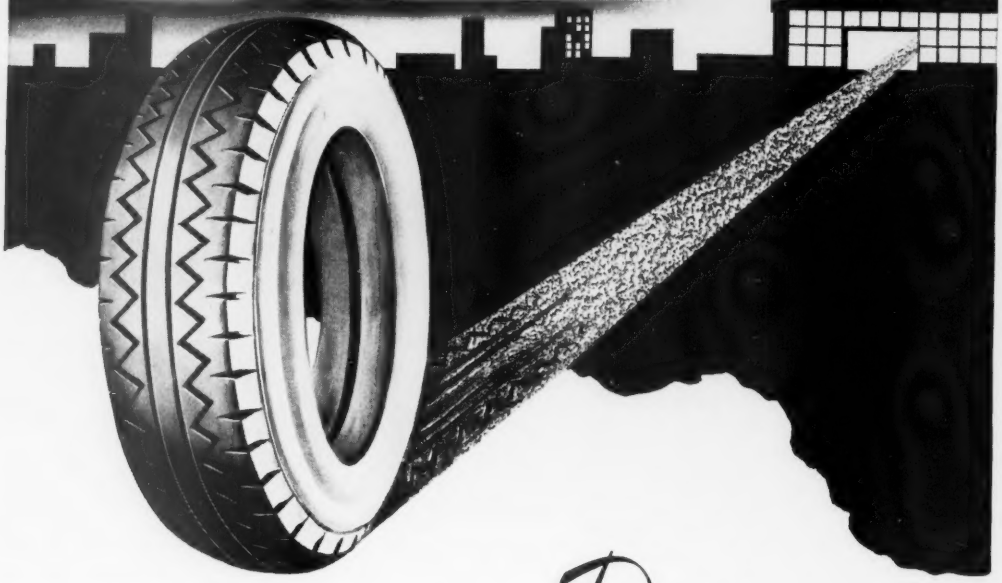

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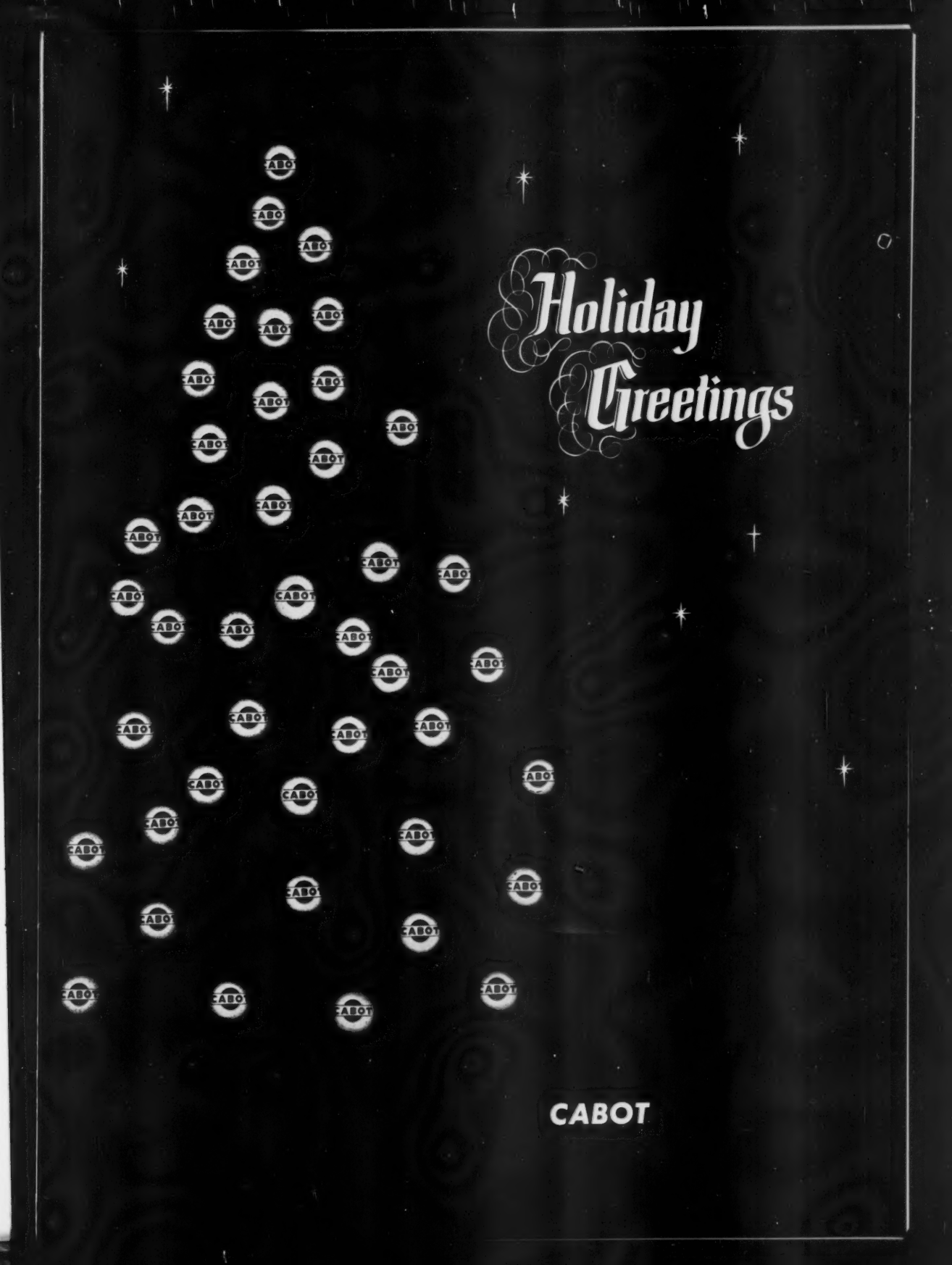
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BIBLIOGRAPHY OF RUBBER LITERATURE

for 1942-1943

This is the sixth edition of the Rubber Bibliography, the first of which was published in 1936 covering the literature of 1935. The first four editions were published by Rubber Age, while the last two, 1940-1941 and 1942-1943 were published by the Division of Rubber Chemistry of the American Chemical Society.

The current edition includes references to patents as well as to the literature, and includes short, one-sentence abstracts with each reference.

A Board of Editors consisting of John McGavack, *Chairman*, and C. C. Davis, M. E. Lerner, Donald Cable, V. L. Burger and T. L. Wilson compiled and screened the data appearing in this work.

The major objective of the Rubber Bibliography is to offer references to all of the literature and patents on rubber published throughout the world in the specific period 1942-1943. All original articles, reprints, translations, abstracts, etc., are grouped in a single reference so that the researcher may quickly locate the source of the original article.

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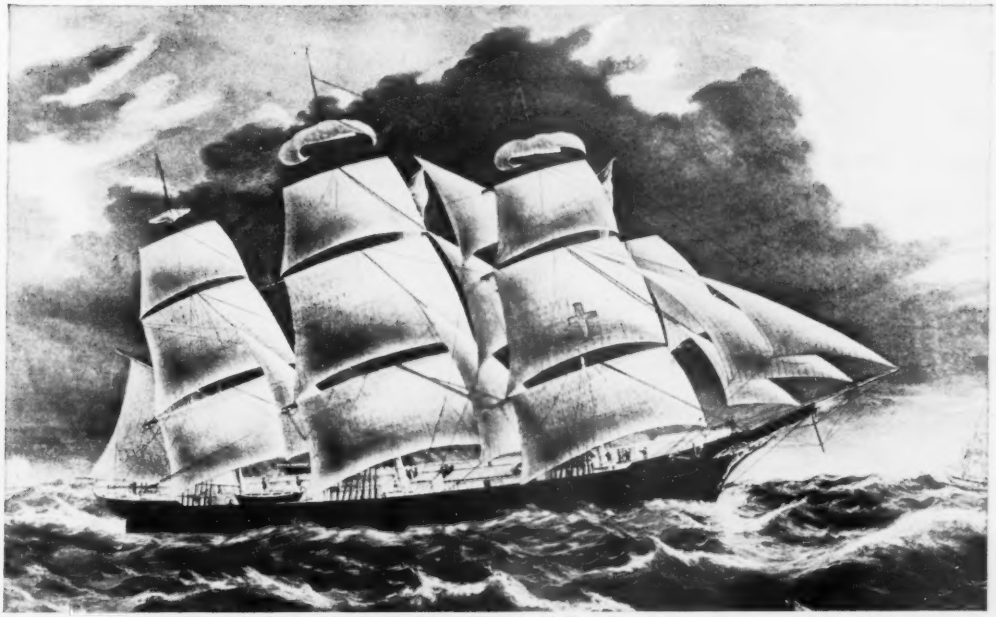

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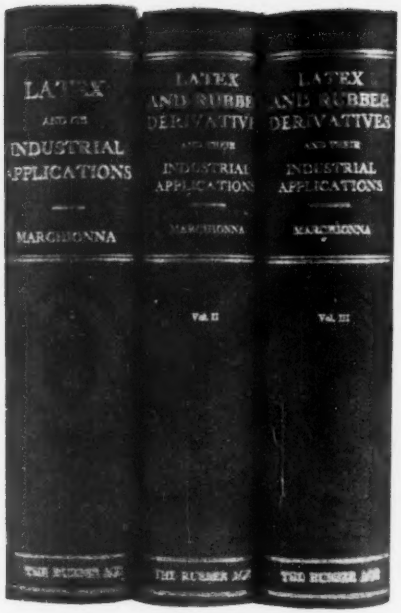

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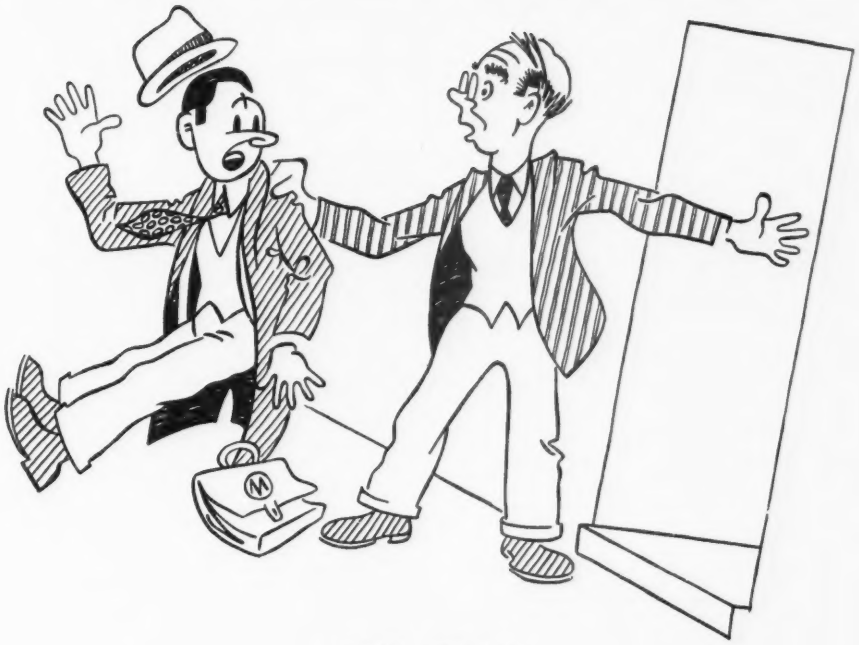

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Vol. 68, No. 3 DECEMBER, 1950

Compounding of Polyvinyl Chloride

By H. M. ZIMMERMAN and P. J. WEAVER

B. F. Goodrich Chemical Co., Cleveland, Ohio

THE PURPOSE of this paper is to present the problems encountered by the vinyl compounder and describe the materials employed by him in alleviating his difficulties. The scope of this discussion will be limited to compounding for calendering, injection molding, and extrusion operations. Compounding for other methods of processing which involve vinyl latices, organosols, plastisols, and solutions requires different techniques which are highly specialized and could be used as the basis for another paper.

The equipment used in processing vinyl plastics, such as mills, Banburys, calenders and extruders, are quite familiar to the rubber compounder. The problems of vinyl compounding are also similar to those encountered in rubber compounding, but the methods of meeting these problems are somewhat different due to inherent differences in the two materials.

Polyvinyl chloride and vinyl copolymer resins are today the largest selling plastic materials on the market. The chemical and oil resistance of polyvinyl chloride resin is outstanding. However, the unmodified resin has had limited commercial application since it is a hard, horny, inherently rigid thermoplastic which cannot be readily processed with conventional equipment. This resin may be converted to a usable form however, both from the processing and end-product standpoint, by the addition of such modifying agents as plasticizers, stabilizers, fillers, lubricants, and colors. The various products now being manufactured from vinyl compounds for the most part require materials in the hardness range of 70-95 Durometer "A". The discussion to follow will deal chiefly with the formulation of compounds falling in this hardness range.

MODIFYING AGENTS

Plasticizers

Plasticizers are generally considered to be the most important of the modifying agents added to the vinyl resin, since for a given grade of resin they largely determine the physical properties and chemical resistance of the end-product. The average vinyl compound requires approximately one pound of plasticizer for each two pounds of resin in the recipe. Plasticizers are organic materials having low volatility which when added to the resin under the correct conditions produce a flexible and elastic material. The plastic becomes softer and more flexible as the percentage of plasticizer in the compound is increased. Hence, the flexibility of a vinyl plastic compound is controlled by the amount of plasticizer contained in the recipe, and the physical and chemical properties of the plastic are controlled to a large extent by the type of plasticizer(s) used.

Several classes of organic materials have been found to be suitable for plasticizing vinyl resins. These different classes of plasticizers possess different physical and

TABLE I—PLASTICIZING ACTION OF DIOCTYL PHTHALATE

Parts Polyvinyl Chloride...	100	100	100	100	100
Parts Dioctyl Phthalate....	20	30	40	50	60
Shore Hardness (@ 25° C.)	96C	86C	95A	88A	81A
Parts Polyvinyl Chloride...	100	100	100	100	...
Parts Dioctyl Phthalate....	70	80	90	100	...
Shore Hardness (@ 25° C.)	75A	69A	63A	57A	...

chemical properties, which in turn create different properties in the plastic compound. The plasticizer picture is further complicated by the fact that it is often desirable to use two or more plasticizers in a compound to meet a given price and product specification. Therefore, in order to do intelligent compounding, it should be quite evident that an adequate evaluation program for determining the effect of various plasticizers on vinyl compounds is a necessity.

Methods for evaluating plasticizers will vary, depending upon the laboratory doing the testing and the equipment available for this work. In general, a standard compound containing resin, stabilizer, and the plasticizer to be evaluated, is first fluxed on a laboratory mill. The same compound containing a standard plasticizer is usually milled at the same time for control purposes. The milled sheets are then subjected to a series of tests of which the following are fairly representative:

1. Compatibility
2. Efficiency
3. Volatility
4. Heat Stability (color, stiffening)
5. Light Stability (color, stiffening)
6. Exudation (Fadeometer, oven, air)
7. Brittleness Temperature
8. Electrical Insulation Resistance
9. Varnish Attack
10. General Appearance
11. Chemical Immersion

Most of the above tests have standard procedures which are adequately described in ASTM bulletins and will not be enlarged upon here. However, a brief definition of the first two items will be made here for the purpose of clarity and understanding. Compatibility is a measure of the affinity of a plasticizer for the vinyl resin. Incompatibility is shown by such effects as (a) exudation from a milled sheet during exposure to air or ultra-violet light over a range of temperatures, (b) inability to form a sheet on the mill, (c) graininess or clouding at a crease, and (d) poor physical properties. The more compatible plasticizers are termed primary, and those that are less compatible are termed secondary plasticizers. Efficiency is a relative measure of the solvating action of the plasticizer on the resin. It is usually determined by measuring the modulus, stiffness or hardness of a milled sheet containing a standard amount by weight of resin and plasticizer.

A general list of some of the relatively high molecular weight organic chemicals which are used for plasticizing vinyl resins follows:

1. Phthalates
2. Adipates, Sebacates, and Azelates
3. Phosphates
4. Triethylene Glycol Derivatives
5. Polymeric
6. Ricinoleates
7. Petroleum Derivatives
8. General

A discussion of the various groups of chemicals listed above is included at this point. Whenever possible the chemical name has been used instead of the trade name, since many of these chemicals are made by more than one supplier.

Phthalates: The most widely used general purpose plasticizer for P.V.C., and one that has been used since the early days of the industry, is dioctyl phthalate. Other members of this group include butyl benzyl phthalate, butyl cyclo hexyl phthalate, dibutyl phthalate, dicapryl phthalate, and octyl decyl phthalate. These phthalates are primary plasticizers, and in general give plastic compounds having a good balance of properties. Special properties such as improved low temperature flexibility and others can be obtained by using other classes of plasticizers in conjunction with the phthalates.

The amount of plasticizer required to produce a given hardness compound with P.V.C. resin will vary with the efficiency of the plasticizer. Since dioctyl phthalate is the most widely used plasticizer in vinyl compounding, data concerning its plasticizing action has wide application, and is shown in Table I for reference purposes.

Adipates, Sebacates, and Azelates: The adipates, sebacates, and azelates are used to impart low temperature flexibility to P.V.C. compounds. These plasticizers are generally considered to be primary plasticizers and are usually used in conjunction with other primary plasticizers. This class of plasticizers for the most part has volatility similar to that of the phthalates, and imparts fair to poor immersion resistance to the plastic compounds. An exception to this is dioctyl azelate, which imparts good water immersion resistance to vinyl materials. Typical members of this group are dioctyl adipate, dicapryl adipate, dibutyl sebacate, dihexyl sebacate, dioctyl sebacate, dihexyl azelate, and dioctyl azelate.

Ricinoleates: The ricinoleates are used like the adipates and sebacates to give good low temperature flexibility to plastic compounds. This group of plasticizers imparts fair chemical resistance and is usually considered to be secondary. Typical of this group of plasticizers is methyl acetyl ricinoleate, butyl acetyl ricinoleate, and methyl cellosolve acetyl ricinoleate.

Phosphates: The most widely known member of this group is tricresyl phosphate, which like D.O.P. has been in use since the early days of the vinyl resin industry. The phosphate plasticizers are used to impart non-inflammable properties, low volatility, and chemical resistance to plasticized P.V.C. compounds. Compounds made from plasticizers such as tricresyl phosphate, triphenyl phosphate, and trixylenyl phosphate in general have poor low temperature properties. Improved low temperature properties, with some sacrifice in non-inflammability and chemical resistance, is obtained by using octyl diphenyl phosphate and trioctyl phosphate.

Triethylene Glycol Derivatives: This group consists essentially of tri- and tetraethylene glycols esterfied with C_6-C_{10} acids. They are a moderately priced secondary plasticizer used to obtain low temperature flexibility in plastic compounds. Compounds made with these plasticizers have relatively poor water and oil resistance.

Polymeric: Various polymeric type materials suitable for plasticizing P.V.C. have become available to the vinyl compounder during the past two years. These materials have been gaining steadily in popularity in the

field due to their low volatility and low extractability. In general, they possess good heat and light stability, and have found use in both general and special purpose compounds. Due to the high viscosity of most of these materials, and resultant difficulties with completely incorporating the plasticizer into the resin, they are usually used in conjunction with such plasticizers as D.O.P.

Petroleum Derivatives: Several inexpensive petroleum derivatives are on the market today which provide the compounder with a low-cost secondary type plasticizer suitable for compounding into inexpensive formulations. These materials for the most part are dark colored, have relatively high volatility, and poor outdoor aging characteristics.

General Plasticizers: In addition to the above discussed groups of plasticizers, there are many other materials available which are employed to advantage as plasticizers by the vinyl compounder. One of this general class of materials that is gaining increasing popularity in the field is the chlorinated paraffins. These are low-cost secondary plasticizers, available with chlorine percentages ranging from 40 to 70%. When used in conjunction with primary plasticizers, the chlorinated paraffins impart flame-proof properties to the compound without detracting in general from the other properties. Epoxy type stabilizers have been found suitable for stabilizing these chlorinated paraffins against decomposition at the temperatures encountered in vinyl processing.

Low molecular weight poly alpha methyl styrene is being used as a secondary plasticizer or extender in vinyl compounds. This material is water white, has low volatility, fair heat and light stability, and is moderately low in cost. Its excellent electrical properties make this plasticizer a desirable component of compounds designed for electrical insulation purposes.

Nitrile type synthetic elastomers, i.e., acrylonitrile-butadiene copolymers, have found limited application as plasticizers for P.V.C. resins. Although the plasticizing efficiency of this material is only about one-half as good as that of D.O.P., it can be used to advantage as the sole plasticizer of a vinyl compound. The use of the nitrile elastomers is indicated where complete lack of volatility and migration is desired. This material also imparts excellent grease and oil resistance to the vinyl compound. This type of plasticizer is subject to ultra-violet stiffening due to the double bonds contained in its molecular structure.

Stabilizers

P.V.C. is subject to degradation upon prolonged exposure to heat and/or ultra-violet light. The breakdown of the polymer is usually considered to start with hydrogen chloride splitting out of the molecule. This should result in the formation of conjugated double bond systems and polyene color systems. The initial decomposition is immediately followed by oxidation of the molecule at the points of unsaturation in the molecular chains resulting from the HCl formation. The liberated HCl exerts a catalytic action on this oxidation step, as well as catalyzing the formation of additional HCl.

The various fabricating processes used in manufacturing articles from plasticized P.V.C. require the use of heat and pressure. During the service life of the finished article, it is usually exposed to sunlight for long or short periods of time. Hence, suitable stabilizers are desirable, to protect the compound against degradation which might occur during its processing period and subsequent service life. In addition to the stabilization of the resin, it is sometimes necessary to provide for stabilization of the plasticizer employed in the compound.

Stabilizers are evaluated in a manner similar to that used for plasticizers, by substituting the stabilizer to be evaluated in a standard test recipe. The following characteristics of the test compound are usually considered during such an evaluation:

1. Processing Stability (long-time milling or oven-aging)
2. Light Stability (Fadeometer)
3. Compatibility
4. Printability
5. Heat Sealing
6. Calender Roll Release Characteristics
7. Immersion Resistance

A satisfactory vinyl stabilizer should be a good hydrogen chloride acceptor, without forming a reaction product which will subsequently catalyze further HCl evolution. In addition, a vinyl stabilizer should be a good antioxidant and ultra-violet screening agent. The combined efforts of a large group of laboratories over a period of twenty years have resulted in establishing the following types of materials as being suitable for stabilizing vinyl compounds:

1. Lead Compounds
2. Calcium Compounds
3. Cadmium Compounds
4. Barium Compounds
5. Strontium Compounds
6. Tin Compounds
7. Sodium Compounds
8. Organic Compounds

The sodium and lead compounds have been found effective in both organic and inorganic combinations. The other metals have been found to be most effective in organic combinations, due to their greater compatibility and ease of dispersion. In addition to the metallic compounds, there are a number of non-metallic organic compounds which are effective vinyl stabilizers. These

Versatility of P.V.C. materials is shown in the above view. The garden hose, upper left, is extruded; the heel is molded; the garment bags are made of a solution-coated fabric; the umbrella is made from a Geon latex-coated fabric; the toilet kit is of heavy calendered sheet, and the baby pants are of light-weight sheet. The sample bottles in the center show the forms in which Geon is available.

various classifications of vinyl stabilizers will be discussed separately below.

Lead Stabilizers: *Basic Lead Carbonate* — This is one of the first materials used for stabilization of vinyl compounds. This material imparts good electrical and heat stabilizing properties to vinyl materials. It still finds wide use as a low-cost lead stabilizer for electrical compounding. The white lead is subject to CO_2 evolution at extreme processing temperatures or after an excessive amount of HCl has been liberated from the vinyl resin.

Litharge—Lead monoxide is another stabilizer used early in the vinyl industry. Limited application is still found, due to its good electrical properties. Litharge is not stable in color, and has a tendency to be reactive with many plasticizers.

Basic Silicate of White Lead—This is another good electrical stabilizer which followed after the development of B.L.C. Does not have gassing tendency of the carbonate; however, it has a tendency to absorb moisture.

Lead Ortho Silicate and Silica Gel—This stabilizer has found use chiefly where lead stabilization is desired in translucent compounds.

Basic Lead Silicate Sulfate—Tri basic lead sulfate imparts good long-time heat stability, and is satisfactory for use in electrical compounding. The material is color stable and has no gassing tendency. It is recommended for use where extreme extrusion temperatures are encountered, or where porosity problems have been encountered when B.L.C. was used.

Di Basic Lead Phosphite—This material is a recent addition to the family of lead stabilizers. Compounds stabilized with this material possess excellent sunlight aging characteristics, and they have good heat stability.

Di Basic Lead Phthalate—This is another new lead stabilizer. Compounds containing this stabilizer have very good heat and light stability. It is quite similar to di basic lead phosphite in stabilizing action.

Lead Stearate—The stearates are heat stabilizers and lubricants. Their lubricating action and compatibility limit the quantity usually employed to $\frac{1}{2}$ to $1\frac{1}{2}$ parts per 100 parts of resin.

Di Basic Lead Stearate—This material is very similar to lead stearate in action. It is used very widely in the phonograph record industry as a stabilizer and lubricant in clear and opaque vinyl record compounds.

Calcium Stabilizers: Calcium stearate has long been used as a heat stabilizer for non-toxic applications. Excessive amounts are to be avoided if the article has to be heat sealed. Two new members of this group which have heat stabilizing properties are calcium ricinoleate and calcium acetoacetate acetate. The heat stability imparted by the calcium compounds is not outstanding; however, it is sufficient for certain applications.

Cadmium Stabilizers: The cadmium salts have become popular in the past three years as heat stabilizers in clear compounds. They prevent color formation in the compounds during their initial processing history. They are usually employed as an additive stabilizer to improve heat stability, along with other heat and light stabilizers. Representative of this group of stabilizers are cadmium mercaptide, cadmium 2-ethyl hexoate, cadmium ricinoleate, and cadmium naphthenate.

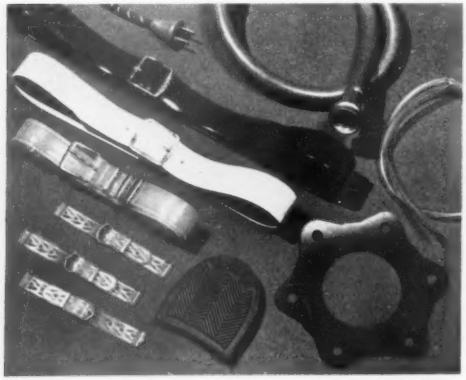
Barium Stabilizers: Barium ricinoleate has been found to impart good long-time heat stability to transparent and opaque formulations. In combination with cadmium stabilizers, a synergistic effect is obtained which permits the compounding of clear stocks having excellent initial color and long-time heat stability. A more recent development is peptized barium ricinoleate, which has enhanced clarity. Barium stearate, like lead stearate, is employed as a stabilizer-lubricant, particularly in calendering applications.

Strontium Stabilizers: Strontium naphthenate was one of the first stabilizers to be made available to the vinyl industry for stabilization of clear stocks to processing temperatures. For this reason it is still used as a reference stabilizer in a few laboratories when evaluating new stabilizers. This material is relatively non-toxic and still finds use today in conjunction with other heat and light stabilizers.

Tin Stabilizers: The organic tin stabilizers appear to be the best materials available for producing clear films having excellent heat and light stability. Clear compounds stabilized with these tin stabilizers show excellent outdoor aging characteristics and lack of exudation tendencies. The tin complex appears to function as an HCl acceptor and antioxidant. The first tin salt in general use was dibutyl tin dilaurate; this has since been followed by dibutyl tin maleate, dibutyl tin oxide, and more recently by a complex polymeric organic tin salt. Compounds containing the tin stabilizers are generally considered to be non-toxic.

Sodium Stabilizers: Alkaline phosphates have been found to impart good light stability to vinyl compounds. Representative of this group are several sodium alkyl phosphates which have gained widespread popularity. These materials have limited heat stabilizing action, and hence are generally used in conjunction with other heat stabilizers. These stabilizers are usually thought to be non-toxic in the concentrations normally employed.

Organic Stabilizers: Epoxy type organic compounds are available on the market, and have been found



Molded and extruded products constitute a major end use of polyvinyl chloride materials. The items shown here, ranging from men's belts to pipe gaskets, are typical examples.

to be effective heat and light stabilizers in clear vinyl compounds, particularly in combination with the cadmium salts. These materials are rapid HCl acceptors and are effective stabilizers for use with the chlorinated plasticizers.

Color Pigments

A discussion of all the various coloring pigments available on the market today is beyond the scope of this article. They are evaluated like the other compounding materials by adding standard amounts of the pigment to be tested to the test recipe. The test procedures used in evaluating the various colors are described briefly below:

Light Stability: Preliminary tests are made in the Fadeometer. Final approval should depend upon actual sunlight aging. Failure of the coloring pigment in this test is observed, as well as its tendency to exude out on the surface.

Heat Stability: Both long molding cycles and oven heat aging are used to test color stability to heat. Vinyl processing involves temperatures of 300-400° F., and hence considerable emphasis is placed on the heat stability of a given color pigment.

Color Transfer: The usual test for bleeding or color migration is to place a sheet containing the color pigment against a sheet of the same compound in either a natural or white recipe. The sample is then stored under pressure at room or elevated temperature. Examination of the surface of the natural or white sheet is made after a given period of time for evidence of color migration.

Electrical Properties: Coloring pigments which are to be used in compounds for electrical insulation applications are also tested for volume resistivity.

The selection of the proper coloring pigment usually resolves itself to some type of compromise, since most of the pigments are deficient to some extent in the above tests. In order to present the data in a manageable form, the coloring pigments normally used in vinyl compounding have been classified according to chemical types. A summary of these commonly used pigments by colors is given in Table II.

In general, EPC channel blacks are the most commonly used carbon blacks for coloring vinyls. In addition, some nigrosine derivatives are used for specialty compounding. Browns have usually been made from a combination of organic reds, yellows, and carbon black; however, the use of iron oxides for this purpose has been increasing recently.

Dispersion of coloring pigments in plasticized vinyls is somewhat difficult, due to the low shear forces involved. Two methods are generally used to overcome this difficulty. The first method is to grind the pigment with plasticizer on a three-roll paint mill. Resinous type plasticizers are very satisfactory for preparing such pastes, and a total solids of 30 to 70% is generally found to be most suitable. The second method of obtaining color pigment dispersion is to obtain flushed colors from the color manufacturer. In this method of manufacture, the color is precipitated from a water solution and the precipitate removed from the water phase by flushing (mixing) the water with the plasticizer. The precipitated pigment is wetted by the plasticizer and transfers to the oil phase during this flushing operation.

In order to obtain close color control on production equipment, when adding small quantities of pigments to a batch, the masterbatch technique is frequently employed. A masterbatch compound is made up containing sufficient color pigment so that one or two pounds of masterbatch is required per production batch. This increases speed of dispersion of the pigment, and decreases errors in weighing out the materials.

Recent development work has indicated that various classes of coloring pigments require specific stabilization. Another way of saying this is that for a given stabilization system there will be preferred colors for optimum heat and light stability. This complicates the evaluation of color pigments for vinyl compounding, since the stabilizer used in the evaluation recipe may give poor results with a given pigment, whereas other stabilizers would produce good results with the same pigment.

TABLE II—SUMMARY OF COMMONLY USED PIGMENTS BY COLORS

Red Pigments	
B.O.N. Red	Cadmium Selenide
Red Lake C	Cadmium Lithopone
Lithol and Lithol Rubines	Iron Oxide
Pigment Scarlet	
Orange Pigments	
Chrome Orange	
Molybdate Orange	
Benzidene Orange	
Yellow Pigments	
Cadmium Yellow	Benzidene Yellow
Chrome Yellow	Oxides
Strontium Chromate	
Green Pigments	
Phthalocyanine Green	
Chrome Green	
Blue Pigments	
Phthalocyanine Blue	
Indanthrene	

Fillers

In rubber compounding, such pigments as carbon blacks and silicas produce strong reinforcing action. In contrast, these pigments and other fillers exert no reinforcing action on vinyls; in fact they detract from the ultimate physical properties of the compound. At first glance, the fillers would appear to have a reinforcing action on the vinyls, since they stiffen the stock and cause an increase in modulus and tensile strength. However, if sufficient plasticizer is added to the filled compound to bring the hardness back down to the same value as the original unfilled compound, the filled compound will be found to have the lower tensile strength and modulus. In general, up to 20 parts of clay or calcium carbonate may be added to a compound at the same hardness without a decrease in physical properties.

A standard test recipe containing resin, plasticizer, and stabilizer is used for evaluation of vinyl fillers. Standard amounts of the filler to be evaluated is added to this standard formulation, and the following characteristics evaluated:

1. Dispersibility
2. Plasticizer Requirement
3. Maximum loading possible without noticeable crazing or decrease in crack resistance
4. Effect on Physical Properties
5. Effect on Processing Characteristics
6. Heat and Light Stability
7. Immersion Resistance

The most common fillers used in vinyl compounding are calcium carbonates, clay, and silica. Of these materials, the first two—calcium carbonates and clay—are the most widely used, due to their low-cost and low stiffening values. Fillers are generally added to vinyl compounds to reduce cost and to produce opacity. Since plasticizer has to be added to the filled compounds to maintain the desired hardness values, the filler causing the least amount of stiffening and hence requiring the least amount of added plasticizer to maintain hardness will be the most desirable. Listed below are the various fillers, in order of increasing stiffening action. Plasticizer requirements for these various pigments are also estimated for use in compounding P.V.C.

VINYL FILLERS

Type	*Plasticizer Requirement* *
Calcium Carbonates	15
Clay	30
Silica	45
Carbon Black (MPC)	65

* Parts of D.O.P. required to maintain constant hardness per 100 parts of pigments in P.V.C. compound.

Calcium Carbonates: The two types customarily used are water-ground limestone and precipitated calcium carbonate. The water-ground material is usually in the particle size range of 5 to 40 microns, and the precipitated carbonates will range from 40 microns down as low as 0.1 to 0.2 microns in size. The very small particle size precipitated carbonates have been found to be difficult to disperse in the vinyls, and generally the larger particle types are employed for this reason. The carbonates, in general, are the most popular filler for vinyls, due to their low cost and favorable effect on retention of physical properties, roll release in calendering, and their lack of plasticizer absorption.

Clay: The customary clay for use with the vinyls is a calcined kaolin clay. Moderate calcining temperatures have been found to produce the most satisfactory material for this use. The clays find large use in electrical compounding, due to their superior electrical properties. They are also used in addition to the carbonates as a low-cost loading material.

Silicas: The very fine particle size silicas are used to some extent in vinyl compounding. They have found application in stiffening hard stocks and in decreasing deformation or permanent set.

Lubricants

The vinyl compounder employs various lubricants when compounding for such processes as calendering, extrusion, and injection molding in order to prevent sticking or adhesion between the hot metal surfaces and the soft hot plastic. Because of their very nature, these materials tend to bloom to the surface of the compound, and care must be exercised in their use so as not to interfere with the heat sealing or printability of the final product.

The lubricants are evaluated in a standard test recipe containing resin, plasticizer, and stabilizer, and various quantities of the lubricant in question. The following items are of particular interest in the evaluation of such materials:

1. Compatibility
2. Effectiveness to do the job recommended
3. Heat Sealing and Printability
4. Stability of Compound to Heat and Light

The more common lubricants are listed below, accompanied by a description of their more customary uses.

Metallic Soaps: Such materials as lead, calcium, and barium stearates are used to provide roll release in calendering compounds. They are also used as extrusion aids.

Paraffin Wax: Its most common use is for lubrication in extrusion and injection molding compounds. This material also improves the surface gloss of these compounds.

Synthetic Waxes: The most common use for these materials is as a lubricant in extrusion compounds.

Carnauba Wax: Increased flow in extrusion and injection molding is obtained by the use of carnauba wax. Increasing use of this material is being found as a release agent in calendering compounds that are not to be printed.

Stearic Acid: Stearic acid is used as a release agent in calendering applications. Quantities in excess of ¾ parts per 100 of resin are to be avoided, due to difficulties with ink adhesion. This material also finds use as a lubricant in extrusion compounds.

Mineral Oil: Good gloss is obtained in extrusion and injection molding formulations by the addition of mineral oil.

In addition to the above listed lubricants, some plasticizers such as dioctyl sebacate and some of the triethylene glycol esters have been found to improve roll release when they are added to calendering compounds. The reason or reasons for this are not clearly understood.

PROCESSING OPERATIONS

We have now discussed the behavior of the various materials which constitute a vinyl compound. Since there is usually a choice of several materials available to the vinyl compounder, which will do the same job, the actual materials used in a given compound will depend to a large extent upon the personal likes and dislikes of the individual compounder. We come now to the problem of how such information is used in the practical application of formulating a compound for the production of a specific item. There are several ways of presenting such a subject, and the one chosen for this paper will be an analysis of a typical formulation for a given application. Three types of compounds will be discussed, one each for calendering, extrusion, and injection molding.

Calendering

Application

Blue, heavy gage unsupported sheeting for upholstery.

Desirable Properties

a. Lowest cost consistent with quality.
b. Good hand and drape.
c. Tear resistance.
d. Lack of stiffness and brittleness at subnormal temperatures.
e. Resistance to outdoor aging.
f. Non-transfer and non-crocking of color.
g. Resistance to burning.
h. Resistance to lacquer lifting.
i. Abrasion resistance.

Recipe

Geon 101 (PVC)	100.0
Dioctyl sebacate	15.0
Octyl diphenyl phosphate	15.0
Polymeric plasticizer	7.0
Dioctyl phthalate	17.0
Calcium carbonate	15.0
Basic lead carbonate	3.0
Barium-cadmium laurate	1.0
Stearic acid	0.5
Phthalocyanine blue	2.0

Analysis

Dioctyl sebacate—The sebacate is primarily used to impart low temperature flexibility; it also improves the drape and aids in calender release action.

Octyl diphenyl phosphate—This phosphate plasticizer is present to impart flame resistance, without having a deleterious effect on the low temperature flexibility.

Polymeric plasticizer—This material was used as the grinding medium for stabilizer and color pigment. It generally improves the drape, and it is possible to improve the processing and light stability of the compound by the proper choice of polymeric plasticizer.

Dioctyl phthalate—The desired hardness of the compound was obtained by the addition of the correct amount of this general purpose primary plasticizer. No deleterious effect on low temperature flexibility and outdoor aging is obtained when adding this material.

Calcium carbonate—This filler is added to the compound in order to reduce the cost of raw materials. The degree of dispersibility of the equipment being used will govern the choice of the fine particle size precipitated carbonate or the coarser water-ground limestone. The quantity of filler is held to a minimum in the recipe to avoid undue loss in tear strength and abrasion resistance.

Basic lead carbonate—This stabilizer was used to impart processing stability for the high calendering temperatures encountered.

Barium-cadmium laurate — This combination stabilizer was primarily used to provide processing stability for the phosphate plasticizer; in addition it also provides for added light stabilization. The stabilizing action of this material is improved when it is used in conjunction with certain polymeric plasticizers.

Stearic acid—Calender release action is provided for by this lubricant. The quantity employed is held to the minimum that provides roll release and still permits heat sealing and printing of the sheeting.

Phthalocyanine Blue—This pigment is the best blue from the standpoint of color transfer, crocking, and light stability.

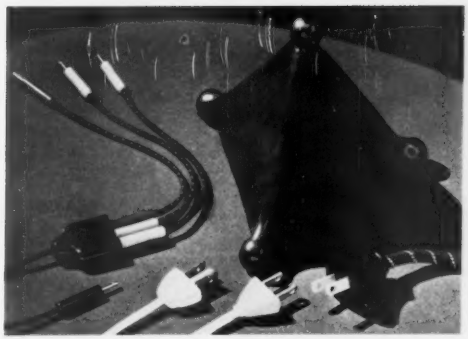
Extrusion

Application

Green, opaque, all-vinyl garden hose.

Desirable Properties

a. Lowest cost consistent with quality.
b. High burst strength and high modulus for resistance to full line pressure at temperatures up to 130° F.
c. Flexibility at or near the freezing point of water, so that the hose may be coiled.
d. Sunlight resistance on long-time exposure, lack of exudation, stiffening, and color failure.



Electrical plugs and red tetrahedron-shaped highway paint protectove made by the injection molding of a Geon molding compound. The paint protector is made by Plastics Engineering, Inc., of Cleveland, O.

e. Relatively low water extraction.
f. Resistance to shattering at temperatures approaching —10° F.
g. High gloss and desirable appearance.
h. Processing stability for quality control.

Recipe

Geon 101 (PVC)	100.0
Dioctyl adipate	20.0
Dioctyl phthalate	30.0
Dibasic lead phosphite	3.0
Calcium carbonate	10.0
Lead stearate	0.5
Phthalocyanine green	1.0

Analysis

Dioctyl adipate—This plasticizer is present in the compound to provide for low temperature flexibility. It was chosen over other low temperature plasticizers such as the triethylene glycol derivatives and the ricinoleates because of its superior sunlight resistance. The resistance to water extraction by the adipate was considered satisfactory in the concentration that is used; however, better resistance can be obtained by using the more expensive sebacates and azelates.

Dioctyl phthalate—This good, general purpose plasticizer was chosen for reasons of cost, good outdoor aging, low extraction by water, low volatility, and its lack of deleterious effects on low temperature properties.

Dibasic lead phosphite—This lead stabilizer is present to impart good processing stability and excellent outdoor aging characteristics.

Calcium carbonate—This filler is added mainly to lower the raw material cost and still provide for a glossy surface upon extrusion. The quantity is kept low so as not to detract from the burst strength of the compound.

Lead stearate—This lubricant is present to provide for ease of extrusion, good surface appearance, and to increase processing stability.

Phthalocyanine Green—This pigment provides the type of bright color desirable for vinyl garden hose, and in addition it has good outdoor aging characteristics.

Injection Molding

Application

Grey plug cover for lamp cord set.

Desirable Properties

a. Lowest cost consistent with quality.
b. Only minimum electrical insulation required.
c. Resistance to oven aging and volatility.
d. Flexible at —10° C.
e. Minimum migration tendency (varnish attack).
f. Pleasing appearance and gloss.
g. Resistant to ultra-violet light discoloration.

Recipe

Geon 101 (PVC)	100.0
Polymeric plasticizer	20.0
Dioctyl phthalate	50.0
Tribasic lead sulfate	10.0
Calcium carbonate	30.0
Paraffin	0.5
Lead stearate	1.0
Carbon black (EPC)	0.1

Analysis

Polymeric plasticizer — The requirements of low volatility and lack of varnish attack indicate the need for a polymeric plasticizer in the compound.

Dioctyl phthalate—This is a good general-purpose plasticizer for use in conjunction with the polymeric plasticizers. It has low volatility and migration tendencies, and this combination of plasticizers will meet the low temperature flexibility requirement. By the omission of less expensive and less stable plasticizers, the problem of discoloration due to light is minimized.

Tribasic lead sulfate—A lead type of stabilizer is desirable in injection molding compounds due to the severe heat history involved in the process. Tribasic lead sulfate was chosen for its lack of any gassing tendency. A large quantity is used to provide for reserve heat capacity, not only for the molding step, but for subsequent oven aging tests.

Calcium carbonate—The carbonate is a good low-cost filler to use in reducing the raw material cost of the compound; in addition it imparts good molding and flow characteristics to the compound and permits the production of articles having glossy surfaces.

Paraffin wax—This material was added to the compound to improve the gloss of the molded article. It also provides supplemental lubrication in conjunction with the lead stearate.

Lead stearate—This is a very good lubricant for use in injection molding operations, since it provides for additional heat stability in the compound.

Carbon black—A small amount of carbon black was added to produce a grey color. The E.P.C. type of black was used because of its ease of dispersion in vinyl compounds.

Better Impact Pulverization Achieved by New Process

RAPID, effective pulverization of previously hard- or impossible-to-grind materials now can be accomplished by a method developed by the Linde Air Products Company, Unit of Union Carbide and Carbon Corporation. The new technique uses liquid nitrogen, in spray form, to cool the material rapidly to a point of maximum fragility, and thereby reduce the amount of energy required for its fracture. Efficiency is such that the new process promises to accelerate the high-speed pulverization of mechanically-tough or heat-sensitive materials such as plastics, pharmaceuticals, insecticides, foodstuffs, substances containing vitamins, and other organic materials.

By the new "Linde" method, previously difficult-to-grind materials are being pulverized at rates, in some cases, of over 700 pounds per hour using small 5 h.p. hammer mills. Saran and polystyrene, previously resistant to speed pulverization, are being successfully production-ground by this method.

The new pulverization process employs the same type of liquid nitrogen now widely used industrially in rapidly cooling precision metallic components for shrink fitting. Commercial liquid nitrogen can maintain a temperature as low as —320° F. As a liquid, it can cool a substance more rapidly than solid refrigerants because it is capable of more efficient heat transfer. It can be used in direct contact with other materials because it is inert and passes off as a gas. The high temperature differential between liquid nitrogen's —320° F. and materials at room temperature results in maximum cooling rates.

Use of this process promises to be most advantageous where: (1) Materials too tough to grind by conventional methods become friable and more easily pulverized at very low temperatures; (2) Materials with low melting points normally overheat and prevent continuous grinding, or grinding results in torn rather than sharply defined particles; (3) Higher pulverizing rates or continuous pulverization are desired without any increase in plant facilities; (4) An inert atmosphere is required to pulverize explosive or oxidizable materials; (5) A low mill temperature will prevent loss of aromatics or volatiles; (6) A much greater, more rapid cooling effect is required, and (7) A constant level of deep refrigeration or unusual temperature control is required.

In operation, liquid nitrogen from a portable source is injected into a special heat exchanger installed between the feed hopper and a high-speed stainless steel pulverizing mill. The fine liquid nitrogen spray plays on the material passing to the mill cooling it by direct-contact heat transfer and simple evaporation. Cold gaseous nitrogen which is evolved precools the material in the feed hopper, and effectively excludes room air which could raise the temperature of the system. It has not been necessary thus far to take advantage of the —320° F. temperature possible with liquid nitrogen to embrittle any material fully prior to grinding.

At the present time, liquid nitrogen pulverization is limited to moderate- and high-cost materials that are able to absorb the added grinding cost. In general this cost depends on the type of material to be ground, scale of grinding operations, and the proximity of liquid nitrogen storage depots. Pulverization of granular ethyl cellulose consumes 1 lb. of liquid nitrogen for each 9 lbs. of final grind. Under similar conditions a tougher material may consume 5 lbs. of the refrigerant per pound of grind, while a more friable material such as 100% DDT may require but 1 lb. of liquid nitrogen for every 10 to 20 lbs. of material.

The Characteristics of Positex

A Natural Rubber Latex Modified for Textile Finishing

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RUBBER and textiles have been associated in a number of products for many years. In fact, one of the first rubber products to be made was a waterproof garment, the mackintosh, made by Charles Mackintosh in the 1820's by applying a rubber solution to a woven fabric.

It is hardly necessary to recall that many of the commonest rubber articles contain as an essential component of their make-up a textile yarn or fabric; tires, belting, footwear, hose, proofings, etc., occur to one immediately. At the same time, an increasing number of textile products contain rubber in one form or other—elastic webbing, fabrics, and the like contain a rubber thread; carpets are backed with a rubber film to impart a non-slip quality and improve pile fixation; cushions, mattresses and upholstery are filled with a latex foam sponge or rubberized hair; and so the list could be extended.

The development of Positex provides a method of incorporating rubber into textile materials in a novel manner to impart special properties without impairing the essential textile characteristics. From the textile point of view, Positex is a new finishing agent for yarns, fabrics, felts, etc., quite small quantities only being required to produce an effect. Rubber has certain inherent advantages among which may be mentioned its water insolubility, its resistance to dilute alkalis and acids, its flexibility and, in the case of Positex, there is the added advantage that the deposit of rubber is particulate on the fibers and is not a continuous film over the yarn or fabric. This fact results in a complete absence of rubberiness and stickiness in the "positized" material; furthermore, the material remains permeable to air and moisture.

Broadly speaking, the rubber applied from Positex acts as a flexible, water-insoluble binder for fibers whether applied to carded material, yarns or fabrics, of wool, cotton, rayon or jute fibers. Carded fiber is bound together into a "felt" which has strength, resilience and yet still breathes. Non-felting fibers, such as jute, cotton or inferior wools and hair, whether needled into hessian or not can be "felted" to form serviceable products (having the advantages of strength, non-stretch and freedom from fiber shedding) for carpet underlays, upholstery, the shoe and clothing trades, packaging, etc. Better quality felting fibers can be made to give harder, tighter and better wearing felts by treatment with Positex at a suitable stage.

Yarns spun from staple fiber obtain their strength by the twisting together of the fibers. Yarns in which there is only slight or no twist have only as much strength as is provided by the friction preventing the fibers from slipping over one another. Such low-twist yarns or rovings show increased strength when "positized." Table I illustrates this effect. It must be emphasized that the fullness, i.e., bulk or apparent diameter of the roving, is largely retained, whereas, of course, twisting to give strength reduces it considerably. The increased strength is valuable for weaving or knitting but also confers other properties on the fabric.

Fabrics of certain types whether "positized" in the piece or woven or knitted from treated yarns show improved properties as regards the retention or binding of fibers. The shedding of fibers from soft fabrics and

Note: This article is based on a lecture given by the author at the Newton Heath Technical School, Manchester, England. Positex is a trade-marked material.

TABLE I—STRENGTHS OF "POSITIZED" WORSTEDS 1/9's ROVINGS

Rubber Content	Tensile (Ounces)
3	11.5
4	14.0
5	16.5
8	22.0
12	27.0
16	31.5

TABLE II—ABRASION TESTS CARRIED OUT ON FABRICS BEFORE AND AFTER RUBBERIZING WITH POSITEX

	Time to Wear Out (Mins.) Untreated	Time to Wear Out (Mins.) "Positized"
A	8½	12
B	5¼	11
C	50	140
D	20	70

TABLE III—BALLING-UP OR PILLING TESTS ON "POSITIZED" CASHMERE FABRICS (MARTINDALE TESTER)

Rubber Content	Weight of Pills Produced (m gm.) 1st Abrasion	2nd Abrasion
0	44.9	26.3
2½	34.3	18.4
4½	27.3	11.3
6½	23.1	6.1

TABLE IV—ABRASION OF CARPETS WOVEN FROM "POSITIZED" PILE YARNS

	Weight of Fiber Shed (gms) Untreated	Weight of Fiber Shed (gms) "Positized"
Carpet A	0.882	0.352
Carpet B	0.842	0.101

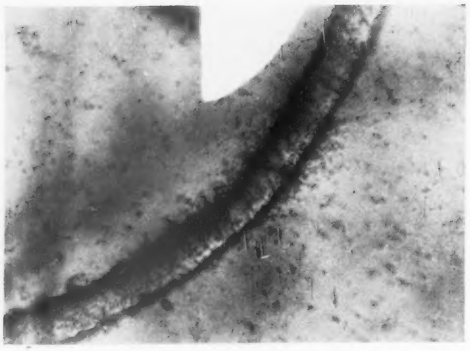

FIG. 1—Photomicrograph showing the deposition taking place when the charges are opposite.

Table VI—Oil-in-Water Emulsions

Stabilizer	pH	Sign	Particle Charge Relative Rate of Cataphoretic Movement
Protein	9.2	—	0.40
Protein	4.0	+	0.30
Anionic Soap	9.2	—	0.95
Anionic Soap	3.5	—	0.85
Cationic Soap	9.3	+	0.53
Cationic Soap	3.3	+	0.80

Table VII—Rubber Latices

Stabilizer	pH	Sign	Particle Charge Relative Rate of Cataphoretic Movement
Anionic Soap	10.5	—	0.66
Anionic Soap	4.0	—	0.47
Cationic Soap	10.5	+	0.35
Cationic Soap	4.0	+	0.42

also from carpets is a phenomenon that must be familiar to all. In the former case, we have the objectionable pilling or balling of the fiber on the surface of the garment in wear, particularly when the fiber is wool, and fiber shedding is the main contribution to the wear of carpets of certain types and qualities. Tables II, III and IV give typical results to illustrate the effect of Positex treatment.

Reference may also be made to subsidiary effects achieveable by the use of Positex. A suitable woven or knitted fabric can be printed with a design applying the latex to certain portions only. On subsequently raising or brushing the fabric, those areas containing rubber resist and an embossed effect is readily produced. Furthermore, Positex can be compounded with certain insoluble pigments which are deposited alongside and held by the rubber to the fiber.

It has been stated above that the deposit of rubber from Positex is not a film but a particulate one on the fibers and, indeed, the valuable properties imparted to the textile arise from this fact. Some consideration will now be given to the manner in which this is achieved.

Latex is film-forming if its moisture is allowed to evaporate and, therefore, some affinity for the rubber must be imparted to the fiber so that deposition occurs prior to removal of moisture; in other words, substantivity must be produced.

The essential condition to obtain this is that the charge of fiber and rubber particle shall be opposite. There are four ways in which this can be achieved—two in alkaline media, and two in acid media. Table V gives the results of bringing rubber and wool fiber together under the various possible conditions, the rubber content recorded being an indication of the affinity of the fiber for the rubber particles of the latex. Figure 1 is a photomicrograph showing the deposition taking place when the charges are opposite; Figure 2 shows that no deposition occurs when the charges are the same in sign.

Having shown that substantivity is desirable and is obtainable by having fiber and rubber particle with opposite charge, we now pass on to consider the means available for controlling the sign of the charge carried by the two surfaces.

The particles in natural rubber latex are stabilized by protein and, as is well known, the charge of such emulsions is negative in alkaline and positive in acid media, on account of the amphoteric nature of the protein. Alternative stabilizers for emulsions are soaps of which there are two types: (1) ordinary or anionic soaps in which the surface active long-chain portion of the molecule is attached to the anion or negatively charged ion, and (2) reversed or cationic soaps in which the surface active portion is attached to the cation. Over the range of pH in which these soaps are chemically stable, the anionic soap stabilized emulsions consist of particles with a negative charge and, correspondingly, the cationic soaps impart a positive charge (Figures 3 and 4).

Table V—Results of Treating Wool Fabric with Rubber Latex under Various Conditions

pH	Charge: Fiber	Charge: Particle	Rubber Content of Fabric (%)
Alkaline	neg.	neg.	¾
Alkaline	pos.	neg.	10
Alkaline	neg.	pos.	11½
Acid	pos.	pos.	2
Acid	neg.	pos.	....
Acid	pos.	neg.	6¾

FIG 2—Photomicrograph showing that no deposition occurs when the charges are the same in sign.

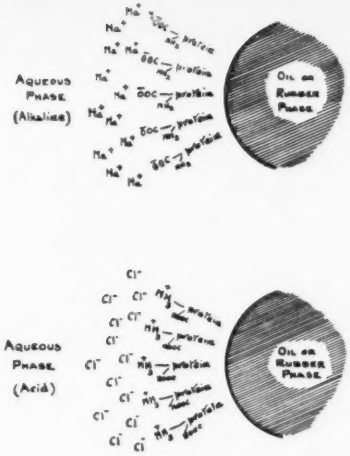

FIG. 3—Protein stabilizer, with charge depending on pH value.

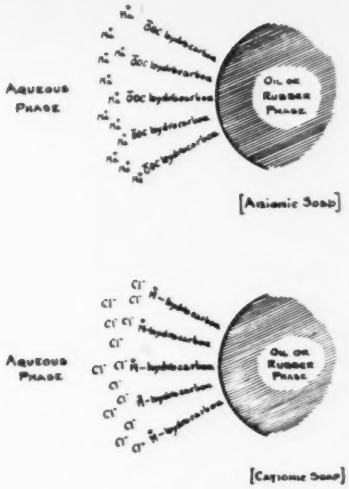

FIG. 4—Soap stabilizer, with charge independent of pH but dependent on type of soap.

Tables VI and VII give data on the sign and magnitude of the charge of particles in oil-in-water emulsions and rubber latices containing these three types of stabilizer. The magnitude of the charge is indicated by the rate of cataphoretic movement under the same conditions.

It is now clear that we can obtain latices containing positively or negatively charged particles in acid or alkaline media. Corresponding charge changes are possible in the case of most fibers.

An exhaustive investigation carried out with the four possible ways of achieving oppositely charged surfaces and hence deposition of rubber led to the conclusion that the most practicable process was that involving a positive rubber particle and a negative fiber in alkaline medium. The result was the development of Positex, a modified natural rubber latex with positively charged particles, which, when suitably diluted and with pH adjusted by means of ammonia, deposits rubber onto most textile fibers, with the results described in the earlier part of this article.

ACKNOWLEDGMENT

This article is a brief review of the work carried out at the Wool Industries Research Association and British Rubber Producers' Research Association on the application of rubber to textiles.

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Resorcinol in Fiber-Reinforced Rubber Goods. (Bulletin No. C-O-142). Chemical Division, Koppers Co., Inc., Pittsburgh 19, Penna. 8½ x 11 in. 6 pp.

The use of Resorcinol in fiber-reinforced rubber goods is described in this technical bulletin. Included is information on the general procedure in the use of resorcinol-formaldehyde latex formulations, typical formulations for these adhesives, applications of the adhesive to the cord or fabric, incidental material on the formulations and their applications, and a bibliography of technical and scientific references.

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Tomorrow's Finishes Today. U. S. Industrial Chemicals, 60 East 42nd St., New York 17, N. Y. 8½ x 11 in. 16 pp.

Most of the resins described in this booklet are recent developments applicable to the production of coatings and finishes. The resins are described according to end use, and the particular advantages to be gained through their use are itemized. Each of the resins are outlined as to physical data and specifications. An index to the resins by end uses is provided. The booklet is illustrated with photographs and drawings.

Curing Tubes, Air Bags, Steam Bags. Rubber Manufacturers Association, Inc., 444 Madison Avenue, New York 22, N. Y. 8½ x 11 in. 8 pp.

This bulletin is a modern edition of a previous service bulletin published by the RMA which deals with the correct care and usage of curing tubes, air bags and steam bags. Profusely illustrated, the bulletin explains the causes of premature failures and contains practical advice on how to get longest service from these products. The bulletin is illustrated with photographs and diagrams.

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Polycin 781 for Rubber Shoe Sole Stocks. (Technical Bulletin No. 23). Sales Service Department, Baker Castor Oil Co., 120 Broadway, New York 5, N. Y. 8½ x 11 in. 10 pp.

The formulation of shoe sole stock involving a high styrene-butadiene copolymer resin (Pliolite S-6) and gelled castor oils is described in this technical bulletin. A comprehensive study of shoe sole compounds is presented. The formulations themselves, processing, as well as testing and interpretation, are discussed. The contribution made by Polycin 781 is outlined. Reports are made in graph form.

Rubber Manufacturing Activities in Various Countries

ADDITIONAL reports on the rubber manufacturing activities in various foreign countries, compiled by the United States Department of Commerce from miscellaneous sources, including embassies and consulates, follow herewith:

Brazil: Production of tires and tubes in Brazil during the first 5 months of 1950 (June figures not available) totaled 544,381 tires of all types and 286,865 tubes, an increase of 96,440 tires over the first 5 months of 1949. Of the tires produced in the 1950 period, 262,795 were for passenger cars, 257,147 were for trucks, 3,690 for tractors, 1,021 for earth movers, 18,438 for aircraft, and 4,980 for motorcycles.

Production continued on a three-shift, round-the-clock basis, and employment continued to increase, the total number of workers employed in tire and tube manufacture being estimated at approximately 14,000 on June 30, as against an estimated 18,500 workers in the rubber industry as a whole. Despite these increases, the industry is still unable to supply the domestic market with tires and tubes, and present plans call for an increase of 33 percent production capacity in the next 12 months.

The position of the industry in obtaining essential materials improved in the second quarter of 1950. Import licenses were issued in sufficient volume to permit the industry not only to satisfy its immediate needs but to begin building reserves. Producers estimated that at the end of June the industry had stocks of imported materials sufficient to cover 30 days' normal operations. Heretofore, producers had exhausted stockpiles of imported materials and were forced to calculate production schedules practically on a day-to-day basis as a result of stringent controls imposed on imports by Brazilian foreign-exchange and import-control authorities.

Trade in tires and tubes continued brisk during the second quarter. Manufacturers are accepting orders for original equipment tires for trucks, tractors, earth movers, and European-type passenger cars only on the basis of 30 days' advance notice.

Imports of commercial and agricultural motor vehicles into Brazil are continuing, and European passenger cars are still entering the market, so that prospects for an increasingly large tire market are bright. Factory sales of tires and tubes in the first 5 months of 1950 amounted to 696,054,312 cruzeiros ($36,890,878, United States currency).

Incomplete Brazilian figures indicate small imports of tires and tubes from the United States. More complete United States export figures show shipments to Brazil in the first 5 months of 1950 of 512 tires and 1,362 inner tubes, valued at $80,386. Among the tires were 278 truck tires, 27 off-the-road tires, and 89 farm-tractor tires.

Venezuela: The rubber product industry in Venezuela, which started in 1942, is now estimated to employ about 450 workers and to represent a capital investment of 4,600,000 bolivars ($1,373,100). Principal products manufactured are automobile and truck tires and inner tubes, rubber footwear, rubber soles and heels, and camelback.

Most of the raw materials required in the industry, including natural rubber, carbon black, tire fabrics, and chemicals, must be imported. The United States is the principal source for these materials, except for natural rubber, which comes mostly from the Far East.

Production of automobile and truck tires and inner tubes constitutes the most important part of the industry. Definite information on production facilities is not available; estimates place capacity between 75,000 and 100,000 units a year, all sizes. The monthly average of production in 1949 was 1,091 automobile tires and 2,081 tubes, and 1,171 truck tires and 1,217 tubes. The monthly average in 1948 was 1,410 automobile tires and 1,416 tubes and 1,818 truck tires and 1,335 tubes.

Severe competition with imported tires in recent years led to appeals for protective regulations in addition to tariffs, and in October, 1949, the Venezuelan Government placed tires and tubes under import control. Effective for the 12-month period ending October 22, 1950, imports of automobile and truck tires and tubes are limited to 140,000 and 105,000 units, respectively. With this market protection, it is expected that tire production in 1950 will reach a record high; an output of 7,000 tires monthly is reported possible this year.

Trade in tires and tubes, which is on an import basis only, has been chiefly with the United States. In 1948, Venezuela imported about 184,500 units, of which the United States supplied 118,487; Canada 36,200; the United Kingdom 20,300; and other countries 10,000. Figures for 1949 are not available. (United States figures show exports of passenger-car and truck and bus tires and tubes to Venezuela in 1948 as 118,487 tires and 79,487 tubes valued at $3,949,641 and 1949 exports as 129,534 tires and 107,981 tubes valued at $3,796,383.)

Under the import restrictions limiting foreign participation in the Venezuelan market this year, the United States share is expected to be about 80,000 units.

Norway: Norway has a limited rubber goods industry, which produces principally rubber belting and footwear for domestic consumption and a modest export trade. In 1948 (latest figures available), with a gross annual investment of approximately 11,000,000 crowns ($2,217,600 at the average rate of exchange in 1948) and employing 3,140 workers, its production totaled an estimated 83,700,000 crowns ($16,873,920) worth of goods. The industry, with a capacity now 50 percent above the prewar levels, is able to supply more than three-fourths of the Norwegian demand for rubber products. However, imports continue to meet a vital portion of requirements.

The value of finished rubber products imported in 1949 totaled 21,400,000 crowns (c. i. f. $3,954,720, converted at the average rate in 1949). An extraordinarily large allocation of foreign exchange for the purchase of tires in September, 1949, and the addition on January 1, 1950 of tires and tubes to the Norwegian "free list," freeing imports from the two largest foreign suppliers—the United Kingdom and France—brought sufficient quantities of all sizes of tires to the Norwegian market for the first time since the war. In fact, in the first half of 1950, the influx of tires brought about a buyers' rather than a sellers' market.

The demand for other rubber products, especially rubberized clothing, druggists' sundries, and medical supplies, all commodities which have not been placed on the free list, remains strong, and importers, as well as manufacturers, have been unable to build up adequate stocks. Supplies of technical rubber products, camelback, soles and heels, are generally sufficient to meet present demands.

Preliminary Metal Removal Eliminated In New Rubber Reclaiming Process

IN the average rubber reclaiming plant, all metal parts, such as beading in tire casings, valves in tubes, and hooks on sneakers, are removed by hand prior to feeding the scrap rubber into the cracking mills. A successful method of removing such metal parts from scrap rubber was recently perfected, thus eliminating a costly hand operation in the process of reduction to a ⅜-inch product and permitting new economies in the reclaiming of rubber.

Interested in eliminating all unnecessary steps, one large rubber company consulted the Allis-Chalmers Manufacturing Co., of Milwaukee, Wisconsin, for suggestions and recommendations. The proposal was to screen off partially cracked rubber being held together by internal metal and recycle back through the cracking mills until this metal was worked free. Properly cracked rubber was to pass through the screen for further processing.

Later in the process, after maceration, separation and digestion are completed, it was necessary to remove all liquids before devulcanizing and sheeting. Allis-Chalmers engineers proposed that a screen be used to remove all but occluded water. It was understood, of course, that the screen would not function as a complete dryer.

After consideration of the requirements, Allis-Chalmers selected a 3 by 6-foot single deck Ripl-Flo screen with 4-inch square opening woven wire cloth for the cracking process, and two 3 by 9-foot single deck Low-Head screens for the dewatering process. In test runs it was discovered that large pieces of casing with unfreed lengths of wire tended to clog and build up on the mill screen. To remedy this condition, the woven wire cloth was replaced by a punched plate having 2½ by 4-inch openings with a number of 1-inch diameter longitudinal skid bars. This proved completely satisfactory.

A flow sheet of the new process is shown in Figure 1. The 3 by 6-foot screen with a primary cracker mill, conveyors, and magnetic separators is placed in circuit ahead of the 6 by 12-foot Ripl-Flo double deck screen and its two sets of cracker mills. The 36-inch long rolls in the mills are of different diameter to secure a differential speed tending toward positive feeding and forcing of material through the rolls, each mill having a 20-inch and a 28-inch diameter roll.

The scrap rubber is put through the primary cracker mill at the rate of approximately 12,000 pounds per hour and conveyed to the 3 x 6-foot screen. A magnetic belt conveyor is placed ahead of the screen to remove any loose metal that has been freed from the rubber and fabric. The oversize from the screen is returned in closed circuit to the mill, as 50% of the casings that come onto the screen are merely cracked and flattened.

The undersize from the 3 by 6-foot screen is fed to the top deck of the 6 by 12-foot screen. Oversize from the top deck discharges onto a belt conveyor, passes below a traveling magnetic separator, through a secondary cracker mill with finer corrugation, and back in closed circuit to the top deck of the screen. Undersize from the top deck and oversize from the bottom deck discharges similarly onto a belt conveyor, passes below a traveling magnetic separator, through the finished cracker mill, and back in closed circuit to the bottom

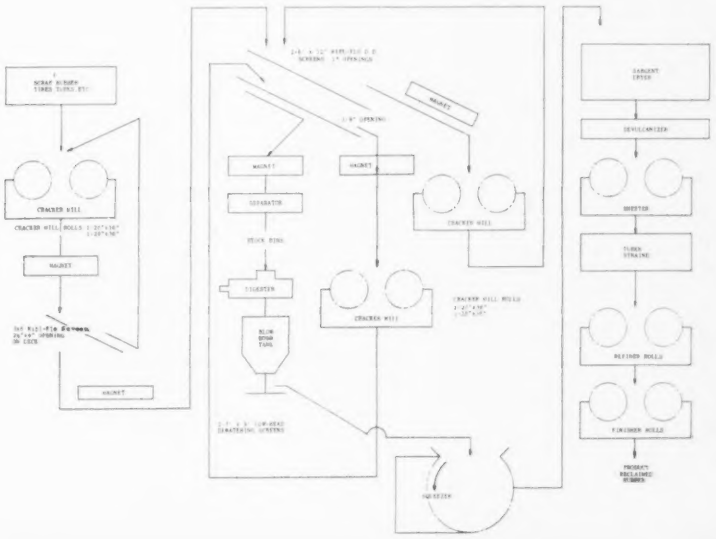

FIG. 1—Flow sheet of new rubber reclaiming process. Cracking rolls and screens are used to remove metal parts and reduce scrap rubber to a ⅜-inch product.

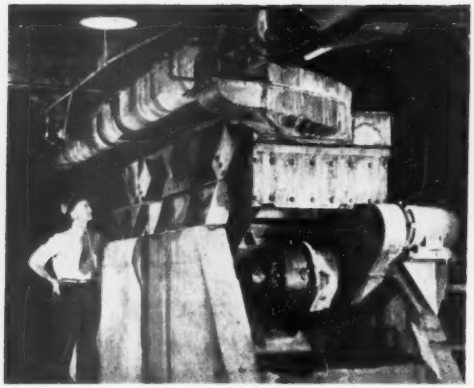

FIG. 2—View of one of the 3 by 9-foot single deck Low-Head screens dewatering macerated rubber. The mechanism is below the screen and is floor mounted with rubber shear mountings to suit special space limitations.

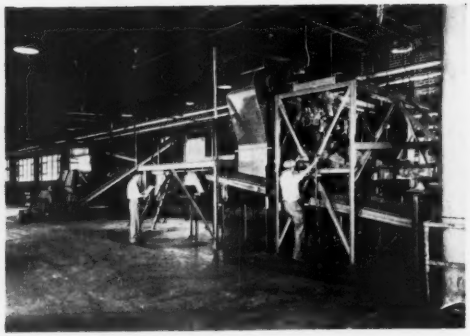

FIG. 3—This view of the new reclaiming facilities shows the crushing rolls, 3 by 6-foot single deck Ripl-Flo screen, and the recycling conveyor for screen overage (in background).

deck of the screen. Undersize from the bottom deck is minus 3/8-inch material, and is the finished product of the cracker mills.

The product passes under another traveling magnetic separator and on to the separating table. This separator is the dry, pneumatic type of concentrating table commonly used in the concentration of some ores. In operation, air is forced upward through a porous supporting surface and a bed of material; motion of the table causes the particles to shift. The fabric, synthetic rubber, and natural rubber separate due to a difference in settling rates in the pulsating bed of which they are a part. The natural and the synthetic rubber are then placed in different stock bins from which they are transferred to digesters where caustic solution is added to dissolve the remaining impurities, mainly fabric.

From the digester the macerated rubber in solution goes to a blow-down tank from which it is fed to the two special 3 by 9-foot Low-Head single deck screens (Figure 2). The screen deck is made of one section of 60-mesh wire cloth to the length of the screen supported on a backing plate with 1/2-inch square holes. The wire cloth is tensioned to the full length of the screen and divided into three longitudinally crowned sections with hold-down bars.

The feed to these screens builds to a depth of about 6 inches; dewatering is practically completed in the middle of the deck, and the remainder of the deck serves essentially as a conveyor. The capacity of these screens is as yet unknown; it is substantially more than enough for the plant concerned and has therefore never been accurately measured. The dewatered macerated rubber then moves to a squeezer that removes occluded water and to a Sargent dryer where the last traces of moisture are removed.

In standardized final steps, the material is treated in a devulcanizer and passed through a series of rolls, emerging as sheets of reclaimed rubber to be used in the manufacture of various rubber goods. An over-all view of the new reclaiming facilities discussed is shown in Figure 3.

Additional Reports of Avoidable Accidents

Safety Inspections: A recent lost-time accident at a rubber plant indicates the need for supervisors to make frequent safety inspections of their departments. An employee was loading light rings on the south end of the plating-line conveyor. A conveyor hook came loose from its position on the cross-member and fell to the floor. It struck the employee as it hit the floor and then bounced up. The accident resulted in a laceration of the leg which required ten stitches to close.

Further investigation of this accident showed that the safety retaining wire for the fallen hook was missing. Undoubtedly, if the supervisors in this department had inspected these hooks periodically, they would have discovered that this safety wire was missing and would have corrected the condition before the accident occurred. Take a lesson from this accident and make it a practice to inspect equipment on a regular schedule.

Congested Conditions: A carpenter was working on the door to a low humidity room which was located near a tandem calender. The hoist, used to take rolls to and from the calender unit, had a roll on it. In addition, other rolls were stored temporarily near the door to the low humidity room. The roll on the hoist was pushed by the calender operator, and as it rolled on the truck, it ran into rolls standing on the floor and knocked one over against the carpenter. The carpenter suffered an injury to his leg.

This accident demonstrates the desirability of having areas around which maintenance or construction employees are working, free from materials in process. Clearing the area should be the first step before work is started. Congested work areas not only are unsafe, but are not conducive to efficient work.

Rubber Safety Newsletter

Solutions to Extrusion and Coating Problems in the Rubber Manufacturing Industry

By JOSEPH H. GEPFERT
Reeves Pulley Company, Cleveland, Ohio

MANY of the products or basic parts of products made by the rubber industry are manufactured by the continuous processing line or system. In any continuous processing system, the most important factor to be considered is that of maintaining a constant, reproduceable material with dimensional accuracy and working characteristics maintained at a constant and controllable value.

As a general problem, let us consider the processing of tire cord or fabric and the extrusion of tread stock for tires as two entirely separate processes that are related only by the fact that they are both base products in the manufacturing of a tire.

The quality of the tire and economy of its manufacture are directly dependent on the success achieved in producing a cord lay which will not cause tread or side wall deformation and on the production of a tread stock which is dimensionally accurate.

The control of both the cord and tread stock is basically a matter of controlling the tension in these materials as they are being processed. Both are extensable and deformable materials and must be controlled carefully while being processed, in order to prevent subquality final products.

Ordinarily, the rayon and cotton cord or fabric used in tires is received from the mill as a roll of raw or uncoated material. No particular specification is maintained beyond a rough thickness and tensile strength tolerance.

To seal or bond cord or fabric in combination with natural or synthetic rubber, it must be prepared by applying an adhesive or coating. Usually this coating is water-soluble latex or water-soluble vinyl.

When a material is coated by a continuous process, the quality of the coating is governed by the time it is exposed to the solution, the density and type of cord fibers, and the rate of penetration. These variables can be controlled for any material by maintaining the tension at a constant value and moving it through the solution at a constant velocity.

The tension of the cord or fabric, or its length per unit volume, is rarely constant in the stock roll. At the same time, the manner in which the material is usually pulled off the roll and started through the coating process also causes a change in tension. Usually a band or strap brake is used and it is almost impossible to regulate the reel braking or hold-back to a uniform value for all speeds and diameters of the roll.

The accurate infeed control of tension and velocity required for successful processing must include a means of adjusting the tension in the cord or fabric to the most desirable value for the specific material, and means for automatically maintaining that value. This can be done simply and economically by using the infeed drive mechanism illustrated schematically in Figure 1.

The basis of the system is the control of the velocity of the material as it is pulled from the stock reel by using a capstan or set of pull rolls to feed the cord into the system at a controlled rate. The stock reel can then be held back by a brake, to prevent overrun, without affecting the working tension of the cord, because the tension is regulated between the feed rolls and the working points in the system.

A loop in the material between the infeed rolls and the work point will remain at constant length when the infeed and delivery rate are equal. Any change in loop length, therefore, indicates the need for correction of the infeed roll speed.

When a roller is placed in the loop that is arranged to move in a guided path, it will take a position that is an exact indication of velocity difference between the infeed and delivery. This device is usually called a floating roll, compensator roll, or dancer roll. The unbalanced weight of the floating roll is an exact measurement of tension; consequently any value of tension may be selected for the material by changing the unbalanced weight of the roll.

To regulate the cord infeed with the same degree of accuracy as the floating roll measures the tension and velocity difference in the material, a variable speed transmission with hydraulic controller is used for driving the infeed roll. The transmission is driven from the main drive of the machine and has an input speed that is in proportion to the production speed of the material. The variable output speed shaft drives the feed rolls and is automatically regulated by the hydraulic controller which is a torque amplifying servo mechanism. The control lever of the hydraulic controller is connected by cable, chain or a suitable linkage to the floating roll, so that any change in the position of the roll results in a corresponding change in the speed of the feed roll.

Since only a fraction of an ounce is required to move the control lever, and since every position down to 1/1000ths of an inch changes the output speed, the controller corrects the infeed velocity for any condition which causes a change in loop length, with a high degree of accuracy.

In operation, the floating roll takes a position at a level

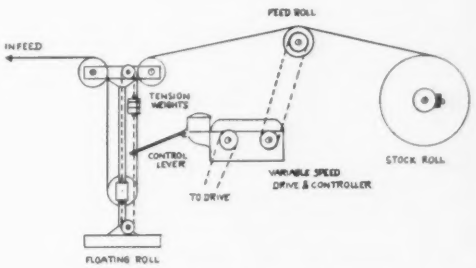

FIG. 1—Infeed drive and control.

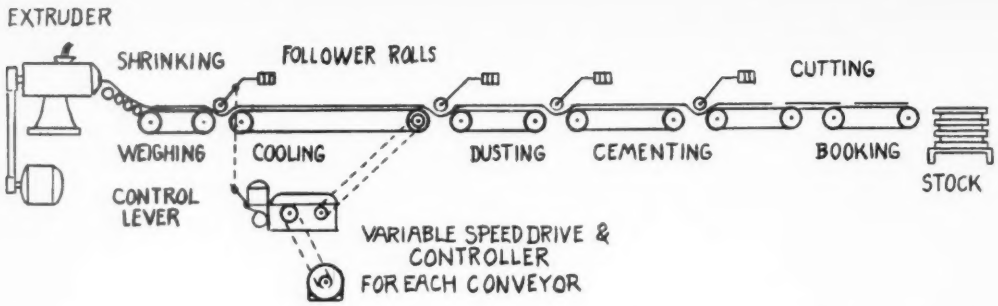

FIG. 2—Complete extruding system with floating controls installed to insure a uniform product for cutting to net lengths or processing.

that corresponds to the production rate of the cord. When the rate is high, the roll is near the top of the guide, and at the minimum rate it will be near the bottom. At any specific speed and tension, it will stay in a relative position with minor movement up or down to make the instantaneous corrections necessary to hold the relationship of the infeed to delivery velocity constant. A change in tension weights on the floating roller will also change the position and speed to correspond to the elastic stretch of the cord in the loop.

Starting or stopping the system usually results in a difference in velocity between the roll and coater, because of the inherent differences between the rotating inertias and frictional drag of the two units. Hence, the roll and the controller will move to correct for this velocity difference. To insure complete control, the floating roll must have enough storage capacity or loop length to hold the material in contact with the roll for the starting and stopping conditions.

The control lever is connected to the floating roll, so that the maximum speed change required is made by the transmission for the corresponding maximum movement of the floating roll. This adjustment is made at the time of installation, by selecting the proper linkage ratio for the connection between the floating roll and control levers.

In the case of extruded products, such as tire treads or tubes, tension is again a major consideration, since it affects the weight per unit of length and the dimensional accuracy of the section as it is taken away by the cooling conveyor system. It also is a means of controlling the residual shrinkage after cutting.

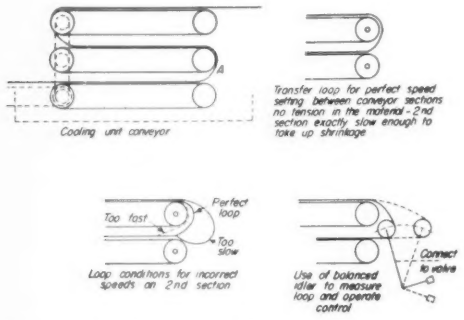
A
Cooling unit conveyor
Transfer loop for perfect speed setting between conveyor sections no tension in the material - 2nd section exactly slow enough to take up shrinkage
Too fast
Perfect loop
Too slow
Loop conditions for incorrect speeds on 2nd section
Use of balanced idler to measure loop and operate control
Connect to valve

FIG. 3—Fundamentals of loop conditions encountered on typical tread lines.

For any given material or screw speed, any change in the compound, variation in milling, the latent heat in the material, or the rate of feed to the screw, results in a corresponding change in the extruder delivery rates. Since these factors cannot be controlled accurately, constant dimension and length of the finished section cannot be maintained unless the speeds of the various conveyors beyond the tuber correspond to the resultant of the aforementioned variables.

It is not too feasible to attempt to regulate the speed of the take-away system from the stock loop between tuber and take-away conveyor. Instead, because the stock is not stable at this point, the take-off rate is most generally regulated manually to give the desired width and weight within the production tolerances. The extruded section is then carried to the shrinkage section where it is allowed to stabilize in contour and shrink. It then becomes the duty of the control to maintain the contour as well as to allow any additional shrinkage due to cooling. As both cooling and shrinkage are directly related with the time involved, it is necessary to have floating controls between each of the various conveyors in the system to insure complete stabilization of the extruded section before cutting to net lengths.

Although the primary control is not at the extruder in tread lines, there are some cases of extruding uniform sections in which it is possible to install a floating control roller between the tuber die and the take-away conveyor. In these installations it is possible to compensate for variations in extrusion as previously mentioned, i.e., automatically. It is still necessary to install floating controls between the conveyor sections to insure a uniform product for cutting to net lengths or processing. A complete system is shown schematically in Figure 2.

On a tread line, the stock is carried over a set of shrinkage rollers after it is extruded and weighed. These rollers may be of the free rolling or so-called "free shrinkage" type, or this section may consist of pre-determined driven tapered rolls of the "forced shrinkage" type. In either case, this section is generally adjustable to allow for variations in stock shrinkage and the material is reasonably stable as it goes into the cooling sections. It is at this point that we establish the control loop and roller to measure changes in the delivery rate of the stock and establish proper speed of the line. The length of the control loop will then be an exact measurement of the instantaneous differences in the velocity of the extruded section and the conveyor. The counterbalanced roller in the loop adjusts the controller and the transmission to automatically follow the speed change requirements. These fundamentals are shown in Figure 3.

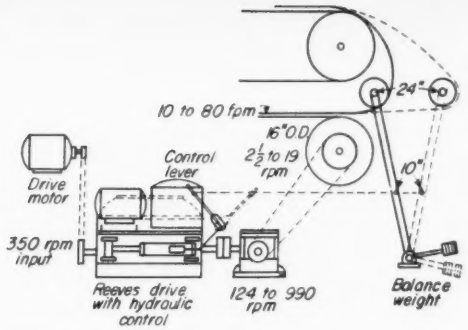

FIG. 4—Automatic control from loop size for tension and velocity.

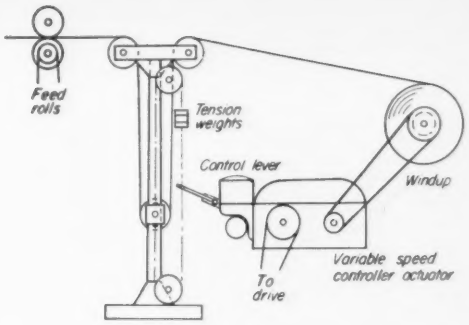

FIG. 5—Compensating loop floating roll.

The function of the conveyor system control is to carry the product through all of the processing without distortion. If we use a control loop between each section, then we automatically adjust the speed of each conveyor section instantaneously and continuously to the proper rate to correspond to the extruder delivery and shrinkage. The exact follow-up of the take-away conveyor will, consequently, prevent stretching or buckling the material which, in turn, controls the dimension of the extruded section.

A system for automatically controlling dimension on this basis is shown schematically in Figure 4. A lightweight pivoted roller is placed in the loop between the shrinkage section and the balance of the cooling conveyor so that it will take a position as is determined by the loop length and will follow any changes in length caused by a difference in speed between them. A cable between the pivot arm of the control roller and the control lever of the hydraulic servo mechanism, automatically adjusts the speed of a variable speed transmission which drives the next conveyor in the system and follows any change in loop length.

The control systems are simple and require very little maintenance. Therefore, they can be used in production with confidence. The action of the control is completely automatic and requires no adjustment by the operator, beyond placing the roller in the loops when the system is started.

The hydraulic controller is a low pressure system with an individual tank, pump, and pump motor, which operates on a volume basis, and hence leakage, air entrapment and contamination are not a problem. The operating forces required by the controller are in the nature of fractions of an ounce and the follow-up is both accurate and self-neutralizing.

The systems used for both the cord and tread stocks are designed for automatically and continuously maintaining the quality of a finished product by proper application of speed and tension control in a continuous processing system for the rubber industry.

There are many other processes which require the same basic thinking and equipment. When the control is applied to fabric, the higher tension values required necessitate higher load values and power capacity. To control fabric as it is calendered, it is necessary and desirable to control the tension as the fabric is re-wound (see Figure 5), as well as the infeed, which merely means duplicating the system at the re-wind end of the process. This gives not only better quality, but a roll that has constant characteristics for further processing.

Letter to the Editor

Dear Sir:

During my occasional visit to the New York office I always take the time to review your very, very interesting publication. In my reviewing I ran across an interesting editorial in the October issue "Fifth Tire." Of course, it goes without saying when comment appears on this item I am more than ever alert, be they for or against the proposition.

I take exception to that part of the editorial where it says "this proposal is being especially pushed by the National Association of Independent Tire Dealers which for years has been urging automobile manufacturers to deliver cars with four tires only so the purchaser may have an opportunity to buy a spare tire of his own choosing."

Truthfully, the action of the National Association of Independent Tire Dealers is a belated action. The present agitation for the removal of this Fifth Tire as an emergency measure was introduced and recommended from the very first by the Burger Tire Consultant Service and the *National Independent*. Our recommendations went even further—the elimination of a new tube with every new replacement tire. Shortly thereafter it was found from the record that the tire dealer association then took appropriate action. At the time that our position was taken we polled our nation-wide subscribers on the question.

The record will also show that we filed briefs in 1941 with the F. T. C. and the antitrust division of the Department of Justice on the Fifth Tire grab alleging that such arrangements between tire manufacturers and car manufacturers was, in our opinion, a violation of the antitrust laws.

For nine solid years, in season and out of season, we have used our efforts to bring about a correction on the monopoly enjoyed by the motor car manufacturers in supplying the Fifth Tire.

I believe that you would desire as a matter of information to your readers to give credit where credit is due.

GEORGE J. BURGER

November 24, 1950

Editorials . . . . . .

Season's Greetings

AS the year draws to a close amid times of worldwide stress, we are more than ever grateful to be living and working in the United States. To our many friends in the industry, we extend our most sincere wishes for a Merry Christmas and a prosperous and peaceful New Year.

THE PUBLISHERS

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Rubber Imports

IT is no secret that the Government is planning to take over the purchasing, importing and sale of natural rubber. The plan, discussed in both Government and industrial rubber circles for several months and brought to the fore by officials of the National Production Authority, would follow in principle the one which was pursued during World War II under the aegis of the Rubber Reserve Co. Discussions have already been held with industry leaders and prominent dealers, brokers and importers, and the plan will shortly be presented to the National Security Resources Board for approval. There is little doubt that it will become effective shortly.

The major objective of the Government's becoming the sole buyer and importer of natural rubber, one heartily endorsed by the rubber manufacturing industry, is to remove competitive influence from the market and thus hold the price down. Federal officials do not think it likely that the move will result in greatly reduced prices, but they feel it will be a definite deterrent to the price moving into higher channels. The price for spot prime has already touched 75 cents a pound in the open market, and is currently hovering around 67 cents. Then, too, many Federal officials believe price control on end-products is simply a matter of time and price ceilings will be easier to enforce if the raw materials involved have uniform prices.

The chances are also quite likely that, as in World War II, Government subsidy will enter the picture so that natural rubber may be sold to the domestic manufacturer at a fixed price irrespective of the fluctuating prices which the Government may have to pay for the product. Authority to buy commodities and resell them at a loss is contained in the Defense Production Act. There is some talk in Washington of pegging the price of natural rubber at 60 to 65 cents a pound, which would represent a loss at today's market figures. There is little doubt that this subject came up during the recent Truman-Atlee talks at Washington, and that plans for holding down the selling price of the producers to the United States Government will come up for discussion at the meeting of the International Rubber Study Group which will be held in Washington next month.

Increased Prices

AS REPORTED elsewhere in this issue, the price of GR-S has been increased to 24.5 cents a pound and that of GR-I (butyl rubber) to 20.75 cents a pound. Both formerly sold for 18½ cents a pound. In addition, the charge for shipping these materials in carload lots has been increased one cent a pound, with proportionate increases applying to less-than-carload shipments. The new prices, inaugurated by the Office of Rubber Reserve, went into effect on December 7.

Announcement of the higher prices on government-made synthetic rubber came as no surprise to the industry, although the 24.5 cent price for GR-S was slightly higher than had been anticipated. Even before the reactivation program was put into effect there was talk of higher prices on both GR-S and GR-I. Start of the reactivation program, with increased costs of raw materials, particularly butadiene from alcohol, resulted in renewed efforts on the part of RFC officials to secure higher prices. Major opposition came from the Economic Stabilization Agency, officials of which pointed out that the government was setting a bad example by raising prices on its own products when it was asking industry in general to hold the price line in the battle against inflation.

It is too early to determine the effects of the price increases in the rubber industry. Slide rules are in evidence at almost every rubber factory as executives try to determine whether the higher costs can be absorbed or will have to be passed on to the consumer. The problem revolves around the increasing use of synthetic rubber and the resultant decrease in the amount of higher-cost natural rubber, as decreed by government edict. Many manufacturers are convinced that an even cost balance will be the end result, which would mean no increase in end-product prices. Final decisions, however, will have to be made by individual companies, with an eye toward competitive conditions.

CURRENT NEWS OF THE MONTH

NPA AGREES TO CONFINE NEXT CUTBACK ORDER TO LIMITATION ON FIRST TWO MONTHS OF 1951

THE National Production Authority, in an announcement on December 2, agreed to confine its next rubber cutback order to January and February of 1951, and to launch a joint review with industry of later restrictions. The agency told its Rubber Industry Advisory Committee on December 1 that consumption will be held to the present monthly level of 90,000 long tons in January and February, but that less natural rubber will be available for industry's use. Consumption of natural rubber will be held to 40,000 tons in January and 35,000 tons in February. The balance of the 90,000 tons must come from private and Government synthetic rubber production. The present order, which will continue by amendment, limited natural rubber use to 52,000 tons in November and 45,000 tons in December. NPA has already informed the committee that only 35,000 tons will be available for its use in March, but agreed to review the program for March and succeeding months in view of fast expanding synthetic rubber production and the precipitous international situation.

The present order, NPA Order M-2, will be amended to limit each consumer of dry natural rubber to 54% of his adjusted average monthly base period use in January and to 46% in February. The present limits are 75% for November and 63% for December. The base is the manufacturer's use of natural rubber in the year ended June 30, 1950, plus whatever individual hardship adjustments have been made by NPA.

As indicated, NPA has already made known its intention to restrict natural rubber use to 35,000 tons in March, the same as February. Unless changed, this will be done through a later order, which may be patterned on the wartime specification control system, setting percentage limits for natural rubber use in hundreds of products.

NPA May Ask Foreign Curbs

Officials disclosed that the Government may ask other nations to follow our lead and restrict their use of natural rubber. Such an appeal was recommended by the industry committee to speed accumulation of natural rubber for the nation's defense stockpile.

A request to other Atlantic Pact countries, Western Germany and Japan, is now being considered by "appropriate Government agencies," it was reported, presumably the State and Defense Departments and the National Security Resources Board.

The rubber manufacturers recommended that the Government increase its production of "cold rubber" to about 375,000 tons annually. The Government now produces about 200,000 tons of "cold rubber." They also recommended that GR-S latex output be stepped up to 50,000 tons a year and that half of this be "cold rubber" latex. Present Government expansion plans, it was said, almost match these figures.

Meanwhile, the General Services Administration is pressing for an early revival of the last war's practice whereby the Government served as exclusive purchaser of all natural rubber imported into the United States. General Services Administrator Jess Larson was scheduled to meet leading rubber products manufacturers and New York dealers in Washington, D.C., on December 5, to discuss ways and means of implementing the prospective move and to decide on what form of public announcement to make.

At this writing, no final decisions have been made. Well informed New York trading circles believe a decision will be made and announced soon. But no time has yet been set for the Government to move in as exclusive purchaser, nor has the mechanism for buying and distributing been developed.

Opinion among non-official sources in Washington, not dependent upon what took place at the December 1 meeting, is that the timing may well depend on market activity in the next few weeks. If the price remains high, the Government may move in quickly. Otherwise, it may delay until a purchasing and distributing system is fully developed.

GSA, through its Federal Supply Service, buys natural rubber for the Munitions Board's stockpile. Under the prospective new move, it would also buy for private consumers. Mr. Larson, as far back as June, urged Government action to drive down the price of natural rubber. Affirmative action on this chief recommendation, a sharp increase in Government synthetic rubber production, followed the outbreak of the Korean war.

Mr. Larson is expected to find ready approval for his new suggestion from both the National Security Resources Board and Congress. Both have sharply criticized high rubber prices. In 1951, Government purchases for the defense stockpile will exceed purchases for private use. U.S. stockpile buying will be the largest single factor in the world market.

Early Reports on Controls

First indications of the effects of Government controls on the consumption of new rubber came in a recent report from the Department of Commerce. Consumption of new rubber, natural and synthetic combined, amounted to 108,464 long tons in September, dropping 6,212 tons from August's all-time peak, but exceeding 100,000 tons for the fifth successive month.

This total was achieved despite a Commerce Department regulation designed to reduce new rubber consumption to 90,000 tons in September. Approximately 15,000 tons of the actual September use was authorized by adjustments of individual consumer's quotas.

The Rubber Manufacturers Association estimates that in October, 117,935 long tons of new rubber were consumed, an all-time high. The higher October use was believed to have been prompted by the announcement on October 17 that November and December use would be held to the 90,000-ton level through a tighter control order issued three days later. NPA sought to head off the under-the-wire rush after the October 17 meeting with manufacturers by announcing that the manufacturers had indicated their intention to revise downward their use of natural rubber during the rest of October at NPA's request.

Members of the Rubber Industry Advisory Committee emphatically denied that such a promise was made. Moreover, they reported that they had refused to make such a promise when it was requested by NPA. The record of October use would seem to bear this out, since natural rubber consumption was reported to have accounted for a record 67,236 tons in October, compared with 59,846 tons in September.

Imports of natural rubber, including natural latex, on the other hand, are informally reported to have reached a record 81,000 tons in October, compared with 61,140 tons in September. An undisclosed quantity of October receipts went into the Government's defense stockpile.

A reference list of both American and foreign scientific papers on high polymers is contained in a new publication, "Bibliography of Recent Research in the Field of High Polymers", recently released by the National Bureau of Standards and now available from the U. S. Government Printing Office at 25c a copy.

SYNTHETIC RUBBER REACTIVATION PROCEEDING AHEAD OF SCHEDULE

C. Edward Rowe, vice-chairman of the Reconstruction Finance Corporation, in a report issued on November 16, stated that the rubber and petroleum industries had made substantial progress in carrying out the program to increase the production of synthetic rubber to meet defense requirements. Copolymer plants which have already been reactivated or are expected to go into operation shortly after the New Year include the 60,000-ton plant at Port Neches, Texas, operated by U. S. Rubber, and the 75,000-ton Los Angeles, Calif., plant, operated by the Minnesota Mining & Manufacturing Co. and the Pacific Rubber Co.

The 30,000-ton plant to be operated by the Kentucky Synthetic Rubber Corp. at Louisville, Ky., is another of the copolymer plants soon to be in operation. The over-all responsibility for reactivating this plant was assigned to the Firestone Tire & Rubber Co., by the Government. Firestone recently announced that the Chemical Plants Division of the Blaw-Knox Co. had been engaged to reactivate the Louisville plant.

Another copolymer plant soon to be made operative is the 30,000-ton plant at Akron, Ohio, operated by the Goodyear Synthetic Rubber Corp. The 90,000-ton plant at Institute, W. Va., operated by the B. F. Goodrich Chemical Co. is scheduled to go into operation shortly after the first of the year. Another plant in this category is the 38,000-ton GR-I plant at Baton Rouge, La., which is operated by the Esso Standard Oil Co. All the other plants produce GR-S.

Raw Materials Situation

Raw materials plants already reactivated or scheduled to go into operation within the next few weeks include the 40,000-ton alcohol-butadiene unit at Louisville, Ky., operated by Carbide & Carbon Chemicals Co.; the 40,000-ton alcohol-butadiene plant at Kobuta, Penna., operated by the Koppers Co.; the 25,000-ton petroleum-butadiene plant at Los Angeles, operated by Shell Chemical Co.; the 18,000-ton petroleum-butadiene plant at El Segundo, Calif., operated by Standard Oil Co. of Calif.; the 15,000-ton petroleum-butadiene plant at Baton Rouge, La., operated by the Copolymer Corp.; and the 50,000-ton petroleum-butadiene plant at Houston, Tex., operated by Sinclair Rubber, Inc.

Mr. Rowe stated that the general-purpose synthetic rubber facilities of the Government in January, 1950, were producing at an annual rate of 220,000 long tons. The production has now been stepped up to a rate of 430,000 long tons. It is expected that by the first of the year the production will exceed 600,000 long tons annually and that in the early spring the goal of 760,000 long tons established by the President will be attained.

It will be seen that two of the reactivated butadiene plants will use alcohol as the basic raw material. Use of these plants which have been shut down since the close of World War II is necessary because the projected requirements are in excess of the capacity of the plants designed to use petroleum products. The operation of these butadiene plants is necessary to carry out the reactivation program and the facilities are being used even though the cost of production is higher than in petroleum-butadiene plants.

General Tire Offers Plan

A new note was introduced into the general situation on rubber, when William O'Neil, president of the General Tire & Rubber Co., in a letter to several Government officials, stated that his company had developed a method whereby synthetic rubber output might be boosted by as much as 22%. Details of the production method were not revealed. Mr. O'Neil was reported to have asserted, however, that "we can make 22% more synthetic rubber, with the present scarce materials and the same equipment, as is now being manufactured in the GR-S plants. We hope to increase this percentage by a considerable amount a little later."

The General Tire president reportedly has informed Government officials that adoption of the process would eliminate part of the need for increasing the size of copolymer and butadiene plants as well as deflating the price of natural rubber.

The quality of the rubber produced by the General Tire process is superior to GR-S synthetic and has been tested in tires and other rubber products, the letter reportedly states. Compensation for development costs and "know how" held by the company in the new process is sought by General Tire.

On this score, the letter is reported to have said: "If we had our own synthetic plant, which we incidentally have started to build, and which will not be ready for six months, we would go ahead and make this synthetic rubber and use it ourselves. We would not give it out to competition until we had covered every phase of the patent situation. However, since crude rubber is 70 cents a pound, and may go even higher, we are suggesting that we offer this to the Government."

Mr. O'Neil reportedly stated in his letter that his company would be content to take in the form of rubber a substantial portion of the savings made possible by the new process as compensation. How the Government could enter into such an arrangement is not clear, however. Presumably, that would be a matter for negotiation.

This raises a fine point in the continued Government operation of synthetic rubber plants. The plants are operated for the Government on a fee basis by private rubber companies, including General Tire at Baytown, Tex. Should any of these firms through private research develop a better product or process, it cannot be put to work in the plan operated by the company without becoming available to all the others through the Government. A program for disposal of the Government plants to private industry, which would encourage competitive research, has yet to be worked out by Congress.

Consequently, a company which develops a new rubber or rubber process must build its own plant or "sell" the development to the Government in order to gain any benefit from its research.

Assures Chemicals for Rubber

In order to assure the adequate supply of chemicals for the rubber program, the National Production Authority has requested that chemical firms supply synthetic rubber producers with all the chemicals they need for the defense program. If this fails, NPA may issue a special "DO" directive. Some NPA officials believe, however, that the Office of Rubber Reserve should be given the authority to issue "DO" priority-rated orders rather than have NPA issue a special directive.

ORR now has no authority to procure materials needed by producers of synthetic rubber. If NPA issues a special order to keep the program rolling, it would take precedence over Atomic Energy Commission, Defense Department, Civil Aeronautics Board and Coast Guard "DO" rated orders now in effect.

So far, NPA officials said, chemical producers have made their products available in large enough quantities to take care of demands from firms producing synthetic rubber. Officials would not predict what may happen next year when some chemicals grow scarcer and the rubber program is going at full speed.

Shortages, either present or potential, have already raised many questions relative to the general rubber situation. Because of a critical shortage of steel washers, for example, many rubber heel and sole manufacturers are operating at partial capacity. The Rubber Manufacturers Association has appealed to the NPA, warning of widespread layoffs in 40 heel and sole factories because of the washer shortage. RMA contends that the problem could be cleared up by assuring another 200 tons of low-carbon cold rolled sheets to the washer fabricators through December 31, 1950.

Meanwhile, a committee of the Society of the Plastics Industry was recently in Washington, D. C., conferring with Government officials on problems facing small plastics plants due to the shortage of polystyrene. Nine hundred plastic injection molders throughout the United States are said to face ruin because of this shortage which is due to the large use of styrene in the synthetic rubber program.

During the past summer, plastic raw material manufacturers, operating at almost full capacity, produced 75,185,000 pounds per month of all kinds of plastic molding powders. Of this total, 23,138,000 pounds was polystyrene which is now being cut back to 17,000,000 pounds. This compares with an anticipated requirement of 30,000,000 pounds per month.

Set Alcohol Withdrawal Rules

Alcohol, as another vital commodity in the production of synthetic rubber, received considerable governmental and industry attention during the past few weeks. The Commissioner of Internal Revenue has outlined the procedures which will be followed for the withdrawal of alcohol taxfree from distilleries and bonded warehouses for use in the synthetic rubber program in the name of the Office of Rubber Reserve.

Provisions are established for the determination of quality and quantity, methods of storage and shipment for alcohol used in the synthetic rubber program. Amendments to the alcohol regulations which greatly liberalized the controls over withdrawals of alcohol to facilitate the synthetic rubber program were originally issued early in November, effective November 8.

Meanwhile, the Maine Potato Industry Council has proposed that the Government use the State's 30,000,000 bushel surplus for making alcohol for synthetic rubber production. Herbert W. Moore, executive secretary of the council, said its members had been told that ORR is proposing to buy a minimum of 30,000,000 gallons of grain alcohol at prices ranging from 80c to $1 a gallon. The Maine potatoes, he said, would supply 18,000,000 gallons at not more than 70c a gallon.

Seeks Synthetic Subsidy

The Phillips Petroleum Co. has asked the Government to approve and help subsidize a $93,000,000 program designed to lift the nation's synthetic rubber output to over 1,000,000 tons in 1951, an increase of 70,000 tons over present production plans. The company has approached the RFC with a proposal calling for expansion of the Government-owned GR-S plant at Borger, Tex., from present capacity to 140,000 long tons a year. The plans also called for the expansion of the petroleum-butadiene production at Borger, from 60,000 tons to a higher, but undisclosed, figure. Phillips Chemical Co., a subsidiary, operates both facilities on contract with RFC.

At the same time, RFC confirmed reports that it is considering appointment of a former Phillips vice-president, Dr. G. C. Oberfell, to a new, high post with the agency. The post may be a new one rather than the now vacant post of manager of the Office of Production, which included RFC's rubber and tin programs. This post has been unfilled since the resignation of Dewitt C. Schieck, recently.

Rhode Island Elects Officers

Approximately 150 members and guests attended the November 16th meeting of the Rhode Island Rubber Club at the Metacomet Golf Club in East Providence, R. I. The meeting featured an election of officers and a talk on "The Manufacture of Foam Rubber" by E. Charlton Crocker of the General Latex & Chemical Corp., Cambridge, Mass. Mr. Crocker's address was similar to one he delivered on October 6 before the Chicago Rubber Group, a full report of which appeared in the October issue of RUBBER AGE. Officers elected for the 1951 season include: *Chairman*, Fred V. Newman (Respro); *Vice-Chairman*, C. Leigh Kingsford (Davol Rubber); *Secretary-Treasurer*, Roy Volkman (U. S. Rubber). Raymond Szulik (Acushnet Process), Gilbert E. Enser (Collyer Insulated Wire), Urbain Malo (Crescent), Harry Ebert (Firestone Rubber & Latex Products), Francis Burger (Kleistone Rubber) and Kenneth Priestley (U. S. Rubber) were elected to the board of directors.

Synthetic Prices Increased

Effective December 7, the Reconstruction Finance Corporation increased its selling prices for synthetic rubber to 24.5c a pound for GR-S and 20.75c a pound for GR-I. The increases will raise the nation's annual rubber bill by approximately $110,000,000. The previous and long-established price was 18.5c for both types. RFC officials stated that prices were raised to make possible continued operation of the Government-owned industry on a "break-even" basis. The new rates will be the standard selling rate for RFC. Differentials of .75c and 1.25c will be added for special purpose rubbers and concentrated latex, respectively. It was also announced that the carload freight charge will be increased to a flat 1c a pound, "with proportionate increases on less than carload shipments." The RFC attributed the price increases to higher production costs.

Russia Secured Synthetic Data

According to testimony presented during the trial of Abraham Brothman, recently convicted in New York City of conspiracy against the government, complete plans for a synthetic rubber plant were turned over by Brothman to Russian officials in the 1941-42 period. The testimony was furnished by Harry Gold, previously convicted on the same charges. Gold testified that he had given Brothman a list of items in which the Soviet Union was interested, including GR-S, and that Brothman furnished him with complete plans in 1942 which, in turn, were handed to his "superior," since identified as Semen H. Semenov, former Soviet trade representative in the United States. Brothman, a chemical engineer then employed by the Hendrick Manufacturing Co., of New York, is said to have stolen the plans from that company, supplemented by data secured during a trip to Akron. Among blueprints turned over to Gold by Brothman were those bearing the name of the B. F. Goodrich Co. and the Dewey and Almy Chemical Co. According to Goodrich officials, Hendrick Manufacturing attempted to sell the company a process for making synthetic rubber before the war but "we had no interest in their process nor did we have any dealings with them." The Goodrich plant for producing synthetic rubber was already in operation at the time.

Organize Detroit Rubber Co.

The Detroit Rubber Co. has been organized at 5060 Edwin St., Detroit, Mich., for the manufacture of mechanical rubber goods and rubber tank linings. Officers of the new company include Edwin J. Post, president; H. Clifford Taylor, vice-president, and Harriette N. Staff, secretary-treasurer. All three were formerly officers and directors of the Paramount Rubber Co. in Detroit.

RUBBER CONSUMPTION IN OCTOBER HITS NEW HIGH OF 117,935 TONS

For the sixth consecutive month, rubber consumption in the United States exceeded 100,000 long tons with October reaching the new all-time high of 117,935 long tons, according to a recent report by the Rubber Manufacturers Association. The October figure is 8.73% higher than the September consumption of 108,464 long tons, and is about 3,000 tons higher than the previous record of 114,676 long tons set in August, 1950.

Consumption of natural rubber during October amounted to 67,236 long tons, an increase of 12.35% over September when 59,846 long tons were used, and almost 5% higher than August when consumption totaled 64,297 long tons. Use of synthetic rubbers in October totaled 50,699 long tons, up 4.28% from September when 46,618 long tons were required. In August, 49,569 long tons were consumed.

Use of reclaimed rubber was also higher in October and was estimated at 31,441 long tons, an increase of 12.82% over the 27,868 long tons used in September, and still higher than the 25,807 long tons consumed in August.

Total new rubber consumption for 10 months in 1950 went over the million mark with 1,045,209 long tons being consumed. This compares with the total year 1949 consumption of 988,903 long tons, and indicates the extremely high level of industrial activity in the rubber manufacturing industry.

September Production Drops

World production of natural rubber amounted to 167,500 long tons in September, 2,500 tons below the record 170,000 long tons reached in July and August, according to estimates of the Secretariat of the Rubber Study Group, the U. S. Department of Commerce reported recently. In the first nine months of 1950, production was estimated at 1,335,000 tons, up 23.3% from the 1,082,500 tons estimated in the same period of 1949.

Synthetic rubber production in September was estimated at 47,500 long tons, against the 50,000 tons produced in August. The August synthetic production figure was the highest since April, 1947. Cumulative synthetic production in the first nine months of 1950 was 375,000 long tons, compared with 346,857 long tons produced in the first nine months of 1949.

World stocks of natural rubber, excluding Russian stocks, and excluding Government stocks in the U. S., the United Kingdom, and France, were estimated at 760,000 tons at the end of September, and consisted of 250,000 tons in producing countries, 237,500 tons in consuming countries, and 272,000 tons afloat. At the start of 1950, stocks were estimated to total 725,000 tons. World stocks of synthetic rubber, excluding Russia, were estimated at 67,500 tons on September 30, as against 110,000 tons on January 1, 1950.

Alexis, Inc., 151 Pryor St., S. W., Atlanta, Ga., is manufacturing children's overalls with a built-in Vinylite plastic panty that is both moisture and stain resistant.

PREPAREDNESS SUBCOMMITTEE ISSUES SECOND REPORT ON RUBBER

Government laxity in the development of new rubber supplies was charged by the Preparedness Subcommittee of the Committee on Armed Services of the United States Senate in its second report on rubber issued on November 21. The Subcommittee, headed by Senator Lyndon Johnson (Dem., Tex.), stated in this latest report that our rubber situation is still far from satisfactory, citing the fact that present industry stocks are smaller than those on hand at the time of Pearl Harbor. It is to be noted that the Munitions Board has offered to supply the Subcommittee with secret data on rubber stockpiling, but the Subcommittee made no direct reference to this data in its report.

In its exposition of problems relative to rubber supplies, the report stated that National Production Authority programming has been more impressive on paper than in practice. It was pointed out that the August, 1950, conservation order favored large companies over their small competitors. Basic injustices, said the report, were not corrected. Instead, NPA temporized the situation by granting small concerns large hardship allowances which had the effect of returning total consumption to pre-order levels.

The Preparedness Subcommittee suggested in its report that industry should increase its rubber stocks just as the Government builds its stockpile. All supplies must be used cautiously and to this end NPA must enforce "truly effective allocation, specification and inventory regulations."

Additional Cuts in 1951

During 1951, stated the report, NPA may have to cut the use of natural rubber back to 35,000 tons a month, and even this figure may be inadequate. The Subcommittee stressed that NPA must be sure that all rubber orders are fair to the smaller rubber firms. Among other factors considered was the contention that present rubber planning fails to consider possible emergency needs of our allies. Friendly nations, stated the report, can help us build needed rubber stockpiles at a faster rate if they will exchange natural rubber for synthetic rubbers.

The Subcommittee took to task British and Dutch rubber growers who, it said, are made more secure by our defense and aid programs and yet are sabotaging preparedness efforts by gouging us and their own countries on natural rubber prices. "We want them to know that what we would freely give for foreign aid and mutual assistance we would not have extorted from us," asserted the report.

Our rubber researchers have many more frontiers to cross, said the Subcommittee, acknowledging the substantial rubber research program being carried on through the Office of Rubber Reserve. The total 1951 Government budget for this is 33% greater than in 1950. Of this sum, one-quarter is alloted for fundamental research, two-thirds for development work, and one-tenth for applied research. Government research funds have also been allocated to several industrial development firms, 6 rubber firms, and 1 oil company. Before World War II, said the report, the United States was far behind Nazi Germany and Communist Russia in synthetic rubber research.

The report also mentioned the fact that recent Agriculture Department studies indicate that guayule rubber can be produced domestically in quality approaching Hevea rubber. Moreover, guayule nursery costs have been cut 80% and yields have been hiked 70% from World War II levels. The Agriculture Department estimates, said the report, that as matters stand, guayule rubber could compete successfully on world markets at 30c or more a pound for No. 1 Ribbed Smoked Sheet. The greatest bar to prompt production in needed quantities is lack of adequate supplies of fresh seed.

In considering the entire question of guayule, the Preparedness Subcommittee stated that the Munitions Board's negative approach to the problem hardly encourages full exploration of guayule's potential contribution to an emergency, for, despite its assurances, the Board is taking no steps to replace deteriorating seeds now in storage. The Subcommittee also took cognizance of the fact that Latin and South American rubber plantations, being developed with U. S. aid, are now producing at a rate of 13,000 long tons annually.

Alcohol Situation Cited

Further criticism was leveled against still another phase of the synthetic rubber program by the Subcommittee which stated that in the face of a need for 125 to 135,000,000 wine gallons of alcohol for synthetics, the Munitions Board has let the General Services Administration go ahead with highly questionable disposals of two Government alcohol plants. These plants, with a capacity of approximately 38,000,000 gallons annually, were sold to private liquor interests for conversion to whiskey production.

After these disposals, said the report, the Office of Rubber Reserve made a study of industrial alcohol producers for supplies needed for synthetics and was offered "not even one gallon." Subsequently, the producers offered ORR 10,000,000 gallons during November and December at between 90c and $1.25 a gallon. Thereupon, ORR contracted with the French Government for 113,000,000 wine gallons, during 1951, at 48½c a gallon, plus 7c shipping charges. American producers finally came through with 10,000,000 gallons for November-December at 80 to 90c a gallon. ORR is still asking for an additional 12 to 27,000,000 gallons needed before the 1951 year-end.

The report further noted that the expansion of synthetic production is going to create benzol shortages. The benzene deficit right now (November 21), said the report, before expanded rubber production and possible needed gasoline expansion, is 30,000,000 gallons.

By early 1951, domestic synthetic plants should be producing 755,000 tons of GR-S annually, the Subcommittee estimated requesting the RFC to investigate the advisability of introducing medium and small-sized firms directly into the synthetic program. Along these lines, the Goodyear Synthetic Rubber Corp. has joined with the General Latex & Chemical Corp., Mohawk Rubber Co., and the Cooper Tire & Rubber Co. in operating an Akron plant now being reactivated.

Meanwhile, RFC is asking large tire and oil companies to let small firms join with them in the operation of synthetic plants. The RFC request followed suggestions recently made by the Justice Department along these same lines. The idea is to spread "know-how" in synthetics, an objective favored by Congress.

90,000 Ton Minimum Use Seen

The Subcommittee report recounted that on November 22, NPA had predicted that increasing synthetic rubber production would allow industry to maintain continued 90,000 ton monthly rubber use during the first quarter of 1951, despite an anticipated 30% cutback in permissable natural consumption. The cutback in natural use, stated the report, will permit the Government to add 450,000 tons to stockpiles during the year.

Tire Shipments in September

Manufacturers' shipments of passenger tires receded in September to 6,975,209 casings from the 9,040,326 shipped in August, a reduction of 22.84%, according to the monthly report of the Rubber Manufacturers Association. Production of passenger tires in September totaled 6,620,742 units, down 5.35% from the 6,994,685 made in August. Manufacturers inventories declined 8.82% to 3,497,333 tires from 3,835,638 units at the end of the previous month. September shipments of truck and bus tires were down 20.27% to 1,251,105 units from the 1,569,230 produced in August. Production of truck and bus tires was 1.41% higher in September with 1,194,871 tires made as against 1,178,244 in the previous month. End-of-month inventories showed a 4.14% drop to 925,699 units from the 965,643 on hand at the end of August. Shipments of automotive tubes were off 17.95% to 7,555,892 units compared with 9,208,677 tubes shipped in August. Production of tubes totaled 7,073,600, down 2.35% from August when 7,243,695 units were produced. Manufacturers stocks of automobile tubes amounted to 6,129,401 units, as against 6,619,472 tubes at the end of the previous month.

Offer New Plasticizer Series

A new line of Indonex C-Series Plasticizers has recently been introduced by the Indoil Chemical Co., 910 So. Michigan Ave., Chicago 80, Ill. The new plasticizers are reported to have the plasticizing efficiency of the Indonex 600 Series, but are much lighter color and are quite color stable. The C-2 plasticizer, typical of the new line, has a specific gravity of .960, a flash point of 410° F., a pour point of —5° F., and Saybolt viscosity (at 210° F.) of 62. A technical data sheet describing the new line is available from the company on request.

DINSMORE SEES WARTIME NEEDS AT ONE MILLION TONS ANNUALLY

Dr. R. P. Dinsmore, vice-president in charge of research and development for the Goodyear Tire & Rubber Co., in an address before the Pittsburgh Section of the American Chemical Society in Pittsburgh, Penna., on November 16, said that the United States, in event of war, will require about 1,000,000 tons of rubber a year, and at least 25% of that amount in natural rubber. Whatever the stockpile may be, he said, it will require one or two years' supply to provide enough for a war of four or five years' duration.

Should war come, Dr. Dinsmore warned, it will be necessary to move considerable numbers of people rapidly from one area to another. Key cities are certain to be bombed and transportation centers disrupted to a greater or lesser degree. This should be sufficient warning that we cannot possibly take time to build up a depleted rubber supply after a war emergency has become a fact, he said.

Dr. Dinsmore attributed the rubber problem as it exists today—desperately short inventories of synthetic, a serious inadequacy in the stockpile of natural—to the failure of the Government to meet quickly the increased demand for synthetic rubber, even though this necessity has been apparent since last March.

"Management of the rubber problem in Washington is now scattered through a number of agencies," he said, "and the difficult coordination at the top is certain to be more or less ineffective because of the numerous other materials similarly situated." Pointing out that our consumption last year amounted to 990,000 tons, imports of natural rubber were only 654,000 tons, from which some rubber had to be withdrawn for the Government stockpile. This year's total national rubber consumption, he estimated, would exceed 1,200,000 tons.

"It is strikingly apparent, therefore, that the growth in the rubber industry since the beginning of the last war, has had to be sustained entirely by synthetic rubber," he declared. "The probability of a quick shut-off of our natural rubber supply is more likely in a future war than it has been in the past, and it is a fact that the supply is inadequate even when the flow is uninterrupted."

World Rubber Consumption

In view of the fact that rubber consumption in the rest of the world is between 850,000 and 900,000 tons, he said, it can be seen that we cannot expect much rubber in excess of 800,000 tons, even without an interference from a foreign enemy. The growth of the Government stockpile, too, must be at the expense of the annual import figure, he added.

With approximately 900,000 tons of synthetic capacity available some time after the first of the year, Dr. Dinsmore said any surplus over that needed in production should be diverted to a synthetic stockpile of not less than 200,000 tons to take care of any peak demands in the future when once more some of the synthetic plants may be idle.

This, he continued, "would represent 4 months' supply at the 1,000,000 ton consumption rate, if we were using 35,000 tons of natural and 48,300 tons of synthetic monthly. It does not seem an excessive inventory to carry as long as our rubber stockpile is inadequate and the threat of a war emergency continues." He pointed out that this ratio is 58% synthetic, which of course would rise if either the total rubber demand would increase or the amount of available rubber should fail.

"The extent to which synthetic rubber can be used without serious injury to product quality," Dr. Dinsmore continued, "varies very widely with the type of product involved." He revealed that passenger tires, which take about 29.8% of the total rubber figure, can use as much as 80% synthetic without serious detriment to quality in that class. Truck tires, however, using 18.8% of the total rubber, can use only 20% synthetic.

The over-all transportation field, using 65% of the nation's rubber, can use 41.2% of the total rubber as synthetic. Non-transportation, meaning mechanical goods, latex products, shoes, heels, flooring, etc., consumes 35% of the rubber volume, and can safely use 21% of the total rubber as synthetic. "A safe ratio from a quality standpoint can be fixed only if the proportionate production of the various types of products remains fixed with reasonably narrow limits," he explained.

As an example, he said, the rubber used in an average truck tire is about 4 times that in an average passenger tire, and the average percentage of synthetic allowable truck tires is only about one-fourth that for passenger tires. So a fluctuation of 3 or 4% in truck tire units, he pointed out, would have considerable effect on the over-all safe ratio of synthetic which can be used for transportation items, and therefore would influence the entire industry picture.

ADAMSON-UNITED ANNOUNCES FOUR ENGINEERING DIVISION APPOINTMENTS

N. J. Elder — H. P. Lamb — R. C. Seanor — G. S. Andrus

Four important executive appointments were recently announced by the Engineering Division of the Adamson-United Co., Akron, Ohio. Norman J. Elder has been named manager of the calender division; Harold P. Lamb, manager of project engineering; R. C. Seanor, chief engineer; and G. S. Andrus, senior engineer. Mr. Elder, a graduate of Akron University, has been affiliated with Adamson-United since April, 1946, following several years' service with the U. S. Navy.

Mr. Lamb, who joined the company in 1939, is a graduate of Fenn College in Cleveland, Ohio. Previously, he was affiliated with the Ohio Rubber Co. at Willoughby, Ohio. Mr. Seanor, as chief engineer, has been with the company since 1946, after 11 years' service with the E. W. Bliss Rolling Mill Division at Salem, Ohio. A graduate of the Carnegie Institute of Technology, he took post-graduate work in engineering at Massachusetts Institute of Technology.

Mr. Andrus is also a graduate of the Carnegie Institute of Technology. He became affiliated with Adamson-United in 1938, after having served as an instructor in engineering at Goodyear Industrial University, in Akron. Adamson-United is a subsidiary of the United Engineering and Foundry Co., Pittsburgh, Penna.

Data on Smithers' Facilities

An attractive 20-page, two-color booklet describing the services it offers to industry has been made available by the V. L. Smithers Laboratories, 2706 First National Tower, Akron 8, Ohio. Since its organization in 1925, much of the work of the laboratories has been directed to the development of special compounds for specific applications and to testing the suitability of raw materials for compounding natural and synthetic rubber and rubber-like materials. Apparatus available for physical and chemical testing is illustrated in the booklet, with brief references to the function of each piece of equipment included. Copies of the booklet are available from the company on request.

Named Executive Vice-President

Arthur R. Gow, associated with the Seamless Rubber Co., New Haven 3, Conn., since 1929, has been named executive vice-president and general manager of the company. Mr. Gow is a native of Boston, Mass., and a graduate of Dartmouth College. Upon his graduation from Dartmouth, Mr. Gow joined the Hood Rubber Co., coming direct to Seamless from that company in 1929. In 1930, Mr. Gow was appointed production manager. He was appointed vice-president and factory manager in 1941, a position held until his recent advancement.

RUBBER SECTION OF NSC HOLDS OCTOBER SESSIONS IN CHICAGO

The Rubber Section of the National Safety Council held two sessions on October 17 and 18 as part of the National Safety Congress in Chicago, Ill., which was held on October 16 through 20. H. L. Andrews, safety director of the Firestone Tire & Rubber Co., Pottstown, Penna., retiring chairman of the Rubber Section, presided at both sessions.

In the first session, Mr. Andrews gave a report on the activities of the Rubber Section, following which J. J. Raytkwich, director of safety of the Naugatuck Chemical Division of the U. S. Rubber Co., Naugatuck, Conn., talked on outstanding facts in connection with the 1949-50 Rubber Section Safety Contest.

According to figures prepared by the National Safety Council, the rubber industry finished in fifth place among all industries with a frequency rate of 5.10 as against an all-industry average of 10.14. This is a reduction of 39% against the base rate period of 1935-39 and was the greatest percentage of frequency reduction of all industries. Foundries with a 34% reduction for the same period were second. The average frequency reduction for all industry was 12%.

A similar good experience also held in severity rate for 1949 for the Rubber Section. In this respect the rubber industry finished 11th among all-industry with a figure of .51 days charged per 1000 man hours worked. The average severity for all industry for 1949 was 1.02. A 22% improvement was made by the rubber industry in 1949 over the base rate period of 1935-39.

W. M. Graff of the U. S. Rubber Co. presented remarks by a contest winner in the large plant category and was followed by John S. P. Wilson, Jr., personnel manager of the B. F. Goodrich Co. at Miami, Okla., who gave the views of a winner in the contest from a small plant viewpoint.

Government Safety Measures

The next portion of the program concerned Government measures affecting safety in the rubber industry. The discussion was led by Mr. Andrews. Participants in the discussion were Glen D. Cross, safety director of the Firestone Tire & Rubber Co., Akron, Ohio; J. T. Kidney, safety director of the Goodyear Tire & Rubber Co., Akron, Ohio, and W. E. McCormick, Department of Industrial Hygiene and Toxicology of the B. F. Goodrich Co., Akron, Ohio.

A luncheon was held by the Executive Committee of the Rubber Section on October 18 at the Stevens Hotel. The second portion of the Rubber Section program was held on the afternoon of October 18th, with Mr. Andrews again presiding.

R. A. Bullock, personnel director of the Corduroy Rubber Co., Grand Rapids, Mich., chairman of the Nominating Committee, gave his report and the following officers were elected for the ensuing term: *General Chairman*, S. A. Wright (Inland Mfg.); *Vice-Chairman in Charge of Program*, G. H. Burkhardt (General Tire); *Secretary*, R. M. Boyles (Midwest Rubber Reclaiming. R. W. Fickes (Goodyear) was named News Letter Editor.

The following members were named as chairmen of the various committees of the Rubber Section: *Engineering*, W. M. Graff (U. S. Rubber); *Trade Association and Liaison*, C. E. Beck (St. Clair Rubber); *Health*, Dr. R. H. Wilson (Goodrich); *Membership*, T. J. Cain, Jr. (Goodrich); *Publicity*, J. J. Raytkwich (Naugatuck Chemical); *Rules and Regulations*, G. D. Cross (Firestone); *Poster*, L. F. Nixon (Canadian Synthetic Rubber); *Statistics*, C. E. Frick (Van Cleef).

Members at large include: H. L. Andrews (Firestone), M. E. Badstuber (Ohio Rubber), E. W. Beck (U. S. Rubber), T. H. Boyd (Manhattan Rubber), R. A. Bullock (Corduroy Rubber), R. A. Farnum (U. S. Rubber), O. Hopkins (U. S. Rubber), Roland Kastell (U. S. Rubber), J. M. Kerrigan (U. S. Rubber Reclaiming), J. T. Kidney (Goodyear), J. E. Lovas (U. S. Rubber), and W. L. Schneider (Goodrich).

Following the election of officers, George W. Harper, associate professor of mechanical engineering at the University of Illinois, Urbana, Ill., gave a most interesting and informative lecture on a "New Look in Industrial Safety". Professor Harper's paper was graphically demonstrated and the essentials of a sound safety program were well presented.

R. R. Meigs, assistant vice-president of the Liberty Mutual Insurance Co. of Boston, Mass., presented a paper on the medical aspects of accident prevention. The complex factors of this problem were outlined by the speaker who handled this detailed and difficult subject in a most interesting and informative manner.

Rubber Heel Use Rises

According to Fred A. Lang, general manager of the Shoe Products Sales Division of the B. F. Goodrich Co., three rubber heels are in use for every one of other types. Mr. Lang stated that in 1951 this ratio will be even higher. To satisfy the surging demand for rubber heels and soles, Mr. Lang estimates that 412,000,000 rubber heels and 204,000,000 rubber soles will be produced in this country in 1951 for use by shoe manufacturers and the repair trade. Surveys show that 65% of all new shoes have rubber heels and that 85% of all heels used to make shoe repairs are rubber. Mr. Lang credited the amazing growth of the rubber shoe products industry to the postwar development of new and improved products which outwear competitive products by as much as 4-to-1.

Columbia Chemical Division of the Pittsburgh Plate Glass Co. has begun partial production of perchlorethylene, an organic chlorinated solvent, at its Barberton, Ohio, plant.

NPA SETS ZINC QUOTAS FOR SCHEDULING DEFENSE ORDERS

Rules for accepting and scheduling rated defense orders for zinc were announced on November 16 by the National Production Authority. Purpose of the order (NPA Order M-9) is to provide for the equitable distribution of rated orders among all producers and fabricators of zinc, NPA said, in order to achieve maximum production and to reduce to a minimum the disruption of normal distribution.

The order provides for a 30-day "lead time" in the scheduling of defense orders by stating that zinc producers and fabricators are not required to accept "DO" orders received less than 30 days prior to the first day of the month in which shipment is requested. The ceiling limitations on "DO" orders set up in NPA Order M-9 are as follows:

No producer of zinc, zinc dust, or zinc oxide will be required to accept rated orders for shipment in any one month of a total tonnage of zinc, zinc dust and zinc oxide in excess of 10% of his total scheduled production of these items for that month.

No fabricator will be required to accept rated orders for the following products for shipment in any one month in excess of the listed percentages of his average monthly shipments of the products during the first eight months of 1950: Zinc base alloys, 20%; sheet zinc, 15%, strip zinc (ribbon), 15% zinc wire, 15%; zinc rod, 15%; zinc shapes—rolled, drawn and extruded, 15%; zinc plate, 15%.

Unless specifically requested by NPA, no dealer shall be required to accept rated defense orders for shipment in any one month in excess of 15% of the total zinc, zinc dust, zinc oxide and zinc products available to him during the month.

NPA Order M-9 also provides for establishment of scheduled programs calling for the production and delivery of zinc, zinc dust, zinc oxide and zinc products when necessary. The order also provides that NPA will arrange to assist those who have difficulty in placing rated orders for zinc. The order also contains provisions for adjustments and exceptions, communications, reports and violations.

Abrasive Firms Study Merger

Minnesota Mining & Manufacturing Co. of St. Paul, Minn., and the Carborundum Co. of Niagara Falls, N. Y., announced on November 27, they were considering a merger. A joint statement by H. K. Clark, president of Carborundum, and W. L. McKnight, chairman of the board of Minnesota Mining, said: "Consideration is being given to a statutory merger of the two companies under the Delaware law on the basis of the conversion of each share of Carborundum common stock into two of the shares of Minnesota Mining common stock, which will result from the previously announced four-to-one split of Minnesota stock. This would be the equivalent of one-half share of the presently outstanding Minnesota common stock for each share of Carborundum common stock."

NPA AND INDUSTRY AGREE ON PROPOSED RAYON DIRECTIVE

A National Production Authority plan for the equitable distribution of defense orders among producers of high tenacity yarn was endorsed by members of the Rayon Yarn Industry Advisory Committee at a meeting in Washington, D. C., on November 16.

Current production of high tenacity yarn, this year, is running at the rate of approximately 300 million pounds. It is in sufficient supply, at present, to meet both defense and non-defense requirements, it was pointed out. However, members of the industry committee felt that NPA should take steps to prevent an inequitable placing of rated orders among producers of high tenacity yarn. Largest use of this yarn is in the manufacture of tires, although there are other defense uses such as cargo and flare parachutes and airplane fuel cell fabric.

The proposed NPA order is patterned along the same general lines as those already in effect covering handling of "DO" priority orders for materials such as steel. The order would limit the volume of rated orders which any producer would be required to accept, and would provide a "lead time" for accepting rated orders. NPA officials emphasized that the proposed regulation applies to high tenacity yarn and not to textile yarn where, as yet, there has been no evidence of inequitable distribution of defense orders.

H. B. McCoy, NPA Assistant Administrator for Industry Operations, who presided at the meeting, told the industry group that the proposed order was designed to distribute the impact of "DO" orders on industry. The objective of NPA, he declared, "is the expansion of production to meet defense needs and at the same time to minimize the adverse effect of the defense program on the balance of our economy."

In answer to questions raised regarding possible defense requirements for high tenacity yarn, Mr. McCoy reminded the group that "the defense program is a changing one" and its requirements may vary from one month to the next. "It may be several months before effects of the defense program may be felt fully," he added.

Coming Events in the Rubber Industry

Jan. 26. Chicago Rubber Group, Morrison Hotel, Chicago, Ill.

Jan. 26. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Jan. 30. Washington Rubber Group, Cosmos Club, Washington, D. C.

Feb. 2. Akron Rubber Group, Mayflower Hotel, Akron, Ohio.

Feb. 16. Detroit Rubber & Plastics Group, Detroit-Leland Hotel, Detroit, Mich.

Feb. 23. Quebec Rubber & Plastics Group, Ladies Night, Community Hall, Town of Mount Royal, Que., Canada.

Feb. 28-Mar. 1, 2. Rubber Division, A.C.S., Spring Meeting, Shoreham Hotel, Washington, D. C.

Mar. 5-9. A.S.T.M., Spring Meeting, Netherland Plaza Hotel, Cincinnati, Ohio.

Mar. 9. Chicago Rubber Group, Morrison Hotel, Chicago, Ill.

Mar. 15. Quebec Rubber & Plastics Group, Queen's Hotel, Montreal, Que., Canada.

Mar. 16. Boston Rubber Group, Somerset Hotel, Boston, Mass.

Mar. 27. Washington Rubber Group, Cosmos Club, Washington, D. C.

Apr. 6. Akron Rubber Group., Hotel Mayflower, Akron, Ohio.

Apr. 10. Chicago Rubber Group, Morrison Hotel, Chicago, Ill.

Apr. 19. Quebec Rubber & Plastics Group, Queen's Hotel, Montreal, Que., Canada. (Joint meeting with SPI and SPE).

Apr. 24. Washington Rubber Group, Cosmos Club, Washington, D. C.

Apr. 26. Rhode Island Rubber Club, Metacomet Golf Club, East Providence, R. I.

Apr. 27. Detroit Rubber & Plastics Group, Spring Meeting, Detroit-Leland Hotel, Detroit, Mich.

May 22. Washington Rubber Group, Cosmos Club, Washington, D. C.

May 24-25. S.P.I., Annual National Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.

June 15. Akron Rubber Group, Summer Outing, Firestone Country Club, Akron, Ohio.

June 15. Boston Rubber Group, Summer Outing. (Tentative).

June 18-22. A.S.T.M., Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

June 22. Detroit Rubber & Plastics Group, Summer Outing.

Sept. 3-7. American Chemical Society, 75th Anniversary Jubilee Meeting, New York.

Oct. 5. Detroit Rubber & Plastics Group, Fall Meeting, Detroit-Leland Hotel, Detroit, Mich.

Oct. 19. Boston Rubber Group, Fall Meeting, Somerset Hotel, Boston, Mass.

Oct. 23. Washington Rubber Group, Annual Banquet, Cosmos Club, Washington, D. C.

Dec. 7. Detroit Rubber & Plastics Group, Xmas Party, Detroit-Leland Hotel, Detroit, Mich.

Dec. 14. Boston Rubber Group, Xmas Party, Somerset Hotel, Boston, Mass.

NPA to Consider Black Problems

Two new industry advisory committees on pigments and carbon black are scheduled to meet in Washington, D. C., in December or January to "explore" mobilization plans in these fields, the National Production Authority announced on November 16. The carbon black committee "will probably come first because of heavy demands on carbon for the Government's synthetic rubber program." About 93% of all carbon black now produced goes into rubber. NPA also wants to organize the paint group quickly because the industry faces many shortage problems and "will feel the pinch of mobilization early next spring." NPA officials pointed out that titanium dioxide, for instance, is already in critical supply. Zinc pigments are short and trouble is likely to develop in other supplies.

25-Year Club Seeks Suggestions

A committee consisting of E. B. Babcock (Firestone), H. A. Winkelmann (Dryden Rubber), and Bruce R. Silver (N. J. Zinc) was appointed at the recent meeting of the 25-Year Club of the ACS Rubber Division in Cleveland to consider ideas for possible expansion of activities of the club. The committee is expected to report on such expansion at the meeting of the club to be held in Washington, D. C., during the 58th Meeting of the Division on February 28-March 1 and 2, 1951. The committee would be pleased to have the suggestions of members of the club. These should be sent to: Bruce R. Silver, c/o N. J. Zinc Co., 160 Front St., New York 7, N. Y.

Inter-American Safety Awards

Word has recently been received that the plant of the Cia Croydon del Pacifico in Cali, Colombia, won the Class B award for the second consecutive year in the Inter-American Safety Council contest, having the lowest frequency rate of the 49 companies competing. The plant of the Royal Venezolana, C.A., in Caracas, Venezuela, won the Class C award in the same contest, again for the second consecutive year.

Over 25,000 items in its line of laboratory chemicals and scientific equipment are listed in a new catalog published by the Burrell Corp., 2223 Fifth Avenue, Pittsburgh 19, Penna.

SYMPOSIUM ON GASKETS FEATURES MEETING OF ASME RUBBER GROUP

A Symposium on Gaskets and Packings was one of the highlights of the annual meeting of the Rubber and Plastics Division of the American Society of Mechanical Engineers, held at the Hotel Statler in New York on November 30-December 1 during the 71st Annual Meeting of the parent society. The symposium was held jointly with the Machine Design Division of the society.

In all, the Rubber and Plastics Division held three technical sessions, one on rubber during the morning of November 30, the symposium on the afternoon of the same day, and a plastics session on the morning of December 1. A total of eight papers was given, and the sessions were well attended, some 70-odd being present at the rubber session, about an equal number at the plastics session, and approximately 125 at the symposium.

George N. Vacca (Bell Telephone Labs.) and Warren E. Scoville, Jr. (U. S. Rubber), acted as chairman and vice-chairman, respectively, at the rubber session; Sherman R. Doner (Manhattan Rubber) and D. J. Buckley (Standard Oil Development) occupied the same positions for the symposium, while John Rehner, Jr. (Standard Oil Development) and Russell B. Akin (Du Pont) officiated at the plastics session.

Papers at Rubber Session

Two papers were presented at the rubber session on the morning of November 30, these being a report on "Advances in the Uses of Rubber in Engineering: 1949-50" by Miss L. E. Straka, research librarian of the Goodyear Tire & Rubber Co., Akron, and "Pressures Developed by Viscous Materials in the Screw Extrusion Machines" by William T. Pigott of the Goodyear Research Laboratory, Akron. Miss Straka's survey covered the literature from July, 1949, to July, 1950, and was devoted entirely to advancements of direct interest to mechanical engineers. Miss Straka preceded the presentation of her report with a brief talk on the current over-all rubber situation.

In Mr. Pigott's paper a mathematical analysis was given with supporting data. Previously developed equations describing the pressures and discharge rates of Newtonian liquids in the screw type pump were briefly discussed and were experimentally verified. These equations were derived on the assumption that the mechanism is one of viscous shearing with no slippage and that the threads are at all times completely filled with liquid. These equations were then applied to rubber-like materials for the two extreme conditions of extruder operation: open discharge (with die removed from discharge end of extruder) and zero discharge (with solid plate sealing the discharge end of the extruder).

For the condition of open discharge of rubber-like materials the discharge rates were found to be much lower than the calculated values. It was concluded that the mechanism for rubber-like materials under this condition is largely one of sliding friction rather than viscous shear and that it is difficult to fill the threads in the charging port when simple strip feeding is used.

For the condition of closed discharge, calculated pressures agreed with observed pressures using a number of different stocks and a number of different screws. In order to calculate the pressure developed at zero discharge, the apparent viscosity of the stock must be known at the effective rate of shear existing in the extruder. The apparent viscosity of a number of stocks was determined by forcing it through circular orifices at different flow rates and calculating the viscosity from Poiseuille's equation. The effective shear rate was calculated by using an expression for the average volume weighted rate of shear in circular orifices.

The plots of apparent viscosity and effective shear rate on log-log paper resulted in straight lines. The effective shear rate occurring in the extruder was calculated for screws with wide thread spacing from the velocity distribution in the threads and an expression for the average volume weighted rate of shear in rectangular orifices. An experiment was devised to experimentally determine the effective shear rate in the extruder at zero discharge. The result agreed with the calculated value. It was concluded that at zero discharge the mechanism for rubber-like materials is one of viscous shearing and that rubber-like materials behave as viscous but highly thixotropic liquids.

At discharge rates intermediate between zero and open discharge (discharge port partly open) the mechanism for rubber-like materials is one of sliding friction in the low pressure areas of the screw near the feed port and one of viscous shearing near the discharge port where the pressure is the highest. For this reason it is difficult to estimate the pressure for rubber-like materials at any condition other than zero discharge using equations based upon a mechanism of viscous shearing.

Symposium on Gaskets

The Symposium on Gaskets and Packings, held during the afternoon of November 30, featured three papers: "Studies of Relaxation Characteristics of Non-Metallic Gasket Materials," by R. G. Farnam, F. D. Farnam Co., Chicago, Ill.; "Rubber and Plastics Packings," by F. C. Thorn, Garlock Packing Co., Palmyra, N. Y., and "Advances in Radial Contact Seals for Revolving Shafts," by E. F. Riesing and H. H. Klein, National Motor Bearing Co., Detroit, Mich.

In his talk, Mr. Farnam first emphasized that the acceptance of relaxation in gaskets as a specification requirement in industry has not yet been generally adopted. He then described a relatively simple apparatus designed for determining the relaxation characteristics of gasket materials at room and elevated temperatures to simulate actual field conditions. Relaxation characteristics of representative gasket materials chosen from several commonly used types tested under various loads, temperatures, and times, including reloadings, were presented in graphic form.

These studies, relating to actual field conditions of gasket applications, indicate the close relationship between the relaxation characteristics of gasket materials and their engineering performance. Since many failures of performance may reasonably be attributed to the specific relaxation characteristics of the gasket materials, these studies should offer a more realistic and direct method and approach for the evaluation of these gasket materials, and for obtaining more accurate and reliable indications of their advantageous applications, according to the speaker.

Non-metallic gaskets, when subjected to flange pressure, all have some degrees of "let-down" after the original tightening of the flanges. This characteristic, which the author tentatively termed relaxation, is quite familiar to everyone having an intimate knowledge of these materials. It is not only a common cause of gasket leaks, but of many gasket failures. Without particular reference to types or causes of relaxation, it was felt that a very definite need existed for determining the extent of this property in gasket materials. The presently used test method, such as those for determining compression, recuperation, and compression set, although valuable in evaluating gasket materials, do not indicate what will happen to these materials under flange pressure in respect to what is required to maintain a seal.

Mr. Thorn's paper on "Rubber and Plastic Packings" contained a comprehensive review of mechanical packings employing rubber or plastics as major constituents. The speaker emphasized the point that the properties of rubber and plastic materials which adapt them to packing uses are not necessarily identical with the properties which are familiar to those who purchase these materials for other uses. He also pointed out that the packing industry is an entity in itself rather than a part of any industry, since it employs practically every material in the animal, vegetable and mineral kingdom, including natural rubber, synthetic rubber, silicone rubber, phenolic resins, nylon, polyethylene, vinyl plastics, gelatin, all of the petroleum products, coal distillation products, glycols, felt, etc.

The speaker stated that the most familiar type of gasket is that cut from flat sheet installed in the commercial bolted flange and exposed to the fluid medium on the edge only. The requirements for such gaskets are basically mechanical rather than chemical. Desired mechanical properties for such gaskets include conformity, retraction modulus, relaxation, compressibility, thermal expansion, coefficient of friction, adhesion to metal, and swelling pressure generated by absorbed fluids. According to Mr. Thorn, these requirements are not included among the conventional rubber properties and standard methods for their measurement do not exist at present.

The paper given by Messrs. Riesing and Klein, a joint presentation, is best described as an illustrated presentation covering the improvements and advancements in the technique of preventing leakage of fluids, gases, lubricants and foreign materials in general through revolving shaft openings in bearing houses, gear boxes, hubs, etc., by means of the unitized radial

contact shaft seal. Numerous slides showing specific applications of these seals were shown, with an oral explanation of the problem which had to be solved given in each instance.

Papers at Plastics Session

Three papers were given at the plastics session, held on the morning of December 1. In a talk on "Strength Behavior of Adhesive Bonds," prepared by H. P. Meissner of the Massachusetts Institute of Technology, Cambridge, Mass., and Gunther H. Baldauf of the Ecusta Paper Corp., Pisgah Forest, N. C., which was presented by Dr. Meissner, it was stated that practically all adhesive systems show an increase in strength with decreasing thickness of the adhesive layer. At least five different explanations for this "thickness-strength" rule were offered in the paper.

Another paper, prepared by Joseph Marin, Yoh-Han Pao, and George Cuff, of Pennsylvania State College, State College, Penna., delivered by Dr. Marin, was on "Creep Properties of Lucite and Plexiglas for Tension, Compression, Bending and Torsion." In an extensive investigation, the influence of stress and time on the creep deformation and creep rates for each type of stress was determined. The equipment devised for the tests was described and various interpretations of the test data were made.

The concluding paper was a report on advances in the plastics field by Henry M. Richardson of DeBell & Richardson, Hazardville, Conn., under the title "Selected Plastics Literature References for the Mechanical Engineer—July, 1949-July, 1950." This report was exceptionally well prepared and presented.

Committee Meeting Held

A luncheon-meeting of the Rubber and Plastic Division's Executive, Advisory and General Committees was held at the Hotel Statler on November 30. It was reported that Gordon B. Thayer, of the Dow Chemical Co., has been elected a member of the Executive Committee for a five-year period, and that Harold W. Mohrman, of Monsanto Chemical Co., and Lloyd E. Muller, of the Buick Research Laboratories, had been elected members of the General Committee. Proposed new by-laws of the Division, prepared by A. G. Gifford, of the Lord Manufacturing Co., were discussed, with some changes suggested.

It was also determined that the Division would hold two sessions during the semi-annual meeting of the A.S.M.E. to be held in Toronto, Canada, during the week of June 11, 1951, and three sessions at the Annual Meeting in Atlantic City, N. J., the week of November 25, 1951. M. E. Lerner (RUBBER AGE) was named Reporting Representative for both meetings.

Linings for steel drums and pails to protect a wide variety of products during shipment and temporary storage are described in a new 12-page booklet entitled "The Inside Story of Protective Linings for Steel Containers," issued by the Glidden Co., Cleveland, Ohio.

Industry Employment Rises

Akron rubber manufacturers added 2,200 male workers to their payrolls during July and August, according to the Ohio State Employment Service. Employment during the summer months increased approximately 3% in the Akron area. Based on the reports submitted by 39 firms, employment in the Barberton area increased 8% during the summer. During August, 3,400 jobs were available at the Akron office of OSES. The largest number of these jobs were available in transportation equipment and rubber factories. Also during August, an average of 2,500 Akron workers were seeking unemployment benefits. This was 740 below the July weekly average. The weekly average in August, 1949, was 6,380.

Goodyear Adds to Lincoln Plant

Goodyear Tire & Rubber Co. has announced that it is constructing a $1,000,000 addition to its belt plant in Lincoln, Nebr. When completed next July, the new building will add over 100,000 square feet to the plant's floor space and increase production facilities by 50%. Officials stated the additional facilities at Lincoln would permit the company to centralize its production of smaller belts at that unit and enable it to use additional space in its Akron plant for production of heavy-duty belts. Goodyear also announced that it is reopening its wartime aircraft plant at Litchfield Park, Ariz., to manufacture metal components for aircraft as well as air envelopes for lighter-than-air ships. During World War II, the plant was used as a modification center for B-24 bombers and to manufacture outer wing panels for flying boats and flight decks for PBY long-range patrol planes.

Adds Los Angeles Warehouse

To facilitate service to West Coast manufacturers, Burgess Pigment Co., Paterson, N. J., has announced that the California Warehouse, 1248 Wholesale St., Los Angeles 21, Calif., is now carrying stocks of Burgess products. These stocks are available through the Merit Western Co. of Los Angeles. The new warehousing facilities are in addition to those maintained at Trenton, N. J., Akron, Ohio, and Providence, R. I.

Akron to Hold Symposium

A Symposium on New Compounding Materials will feature the meeting of the Akron Rubber Group to be held at the Mayflower Hotel in Akron on Friday, February 2. The program has not been completely arranged at this writing, but based on past performances by the Akron Group an interesting symposium of basic value may be expected.

PROCEDURE IS OUTLINED FOR RUBBER ON "DO" APPLICATIONS

Considerable confusion exists in the rubber manufacturing field with respect to the procedure to be followed in requesting allocation of government-produced rubber (GR-S and butyl) to fulfill Government or Defense (DO) Orders. Requests for such allocation must be filed with the National Production Authority at Washington, D. C.

Before applications can be processed, it is necessary to furnish the following information to NPA in duplicate: (1) Name of Purchaser; (2) Purchase Order No. and D.O. if extended; (3) Prime government contract number; (4) End product and number of units; (5) Type and amount of GR-S or Butyl, in total (minimum amount allocated is 1 bale, 75 pounds); (6) Destination where shipment is to be made; (7) Government specification number for non-transportation end products, if possible.

If all of the information is supplied properly, the NPA Industry Operations Bureau processes the application within a few hours, sending it immediately to the Office of Rubber Reserve, and without any further paper work on the part of the appellant ORR issues a permit immediately giving priority over civilian applications due to the fact that the allocation involved is for defense requirements.

Objects to Scrap Shipments

A demand that all shipments of scrap rubber to Communist China be stopped immediately was voiced on December 3 by Senator Herbert R. O'Conor (Dem., Md.). Mr. O'Conor said that 10,500,000 pounds of scrap rubber have been shipped to China since last June, with 4,400,000 pounds being shipped in September alone. Scrap rubber shipments to China have not been subject to license control because it had not been considered a strategic material. Most of the scrap rubber is used in China for making shoes, and as far as is known the country does not possess any large scale reclaiming plants. According to Senator O'Conor, however, sandal-making may now be considered putting the scrap rubber to strategic war use "inasmuch as it would enable thousands of Chinese Red soldiers or their supply-line coolies to keep on the march."

Journal for Industrial Laboratories

Industrial Laboratories Publishing Co., 201 North Wells St., Chicago 6, Ill., has begun publication of *Industrial Laboratories*, a new monthly journal designed to keep all key personnel in industrial laboratories informed of all the new developments in apparatus, equipment, instruments, materials, processes, services, literature and books. The new journal is being circulated without charge to persons holding responsible positions in industrial research. Qualified individuals are invited to request copies of the publication on their company letterhead, with the position of the individual and the company's type of business indicated.

QUEBEC GROUP HEARS McCUNE ON NEWER NEOPRENE APPLICATIONS

The November 16th meeting of the Quebec Rubber and Plastics Group held at the Queen's Hotel in Montreal, Que., Canada, featured an address by Samuel W. McCune III of the Rubber Chemicals Division of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Mr. McCune spoke on "Some Newer Applications of Neoprene." Some 60 members and guests were in attendance.

Mr. McCune first showed the assembled group members a motion picture entitled "Neoprene, the Versatile Chemical Rubber," in order to provide information about the manufacture of neoprene, the properties which it possesses and the wide variety of products in which it is used. Mr. McCune noted that in addition to the well recognized uses for neoprene in conventional resilient products, there are many interesting uses for products which are outside this field.

For example, elasticized cement compositions are being used as decking for ships, as non-slip flooring in railroad cars and industrial buildings, and as decorative floor covering on terraces and sun decks. A special type of flooring which has electrical conducting characteristics has been developed for use in hospital operating rooms and other locations where it is desirable to discharge static electricity.

Protective coatings based upon neoprene are being used to a greater extent in applications where it is desirable to provide protection of metal against corrosion and abrasive wear. Such coatings have been adopted by the Navy for protection of propeller shafts, struts and rudders on high speed vessels where a combination of corrosion and erosion due to cavitation have been a problem. Similar neoprene coatings are being evaluated on aircraft structures made from fiberglas laminates. These parts are subject to rapid erosion under flight conditions unless they are protected.

The treatment of paper is another interesting unconventional use for neoprene. The incorporation of small percentages of neoprene in paper results in improved wet strength, increased abrasion resistance, greater folding endurance in the finished product. In the future neoprene should find an increasingly large share of its uses in these interesting applications for which natural rubber or hydrocarbon types of synthetic rubber are wholly unsuited, the speaker concluded.

Expand Plasticizer Production

Socony-Vacuum Oil Co., Inc., New York, N. Y., has announced that S-V Sovalold C, a plasticizer, is now available to the vinyl resin and nitrile rubber industries in unrestricted quantities. The plasticizer is now being produced in larger volume because of expansion of manufacturing facilities at the refinery in Olean, N. Y. S-V Sovalold C is said to have exceptional solvent power for synthetic resins and for oil-resistant synthetic rubbers. The cost of the product, the company said, is a third of the current price of the cheapest ester plasticizer.

Named Marvinol Factory Manager

Dr. F. Dudley Chittenden

Appointment of Dr. F. Dudley Chittenden as factory manager of the Marvinol vinyl resin plant at Pamesville, Ohio, has been announced by the Naugatuck Chemical Division of the U. S. Rubber Co. Formerly development manager of the Naugatuck Chemical Division, Dr. Chittenden joined U. S. Rubber in 1926 as a chemist in the company's general laboratories after receiving his Ph. D. degree in chemistry from Yale University. For the next 16 years he worked in various capacities connected with chemical research and development, both in the general laboratories and in the company's Providence, R. I., plant. In 1942, he was transferred to the Synthetic Rubber Division and played an important part in the initial development of synthetic rubber. In 1943, he was named chief chemist of the Institute, W. Va., synthetic rubber plant operated by Naugatuck Chemical for the U. S. Government, and in 1945 was named factory manager of the synthetic rubber plant in Naugatuck, Conn. He became development manager of the Naugatuck Chemical Division in 1947. Dr. Chittenden is a member of the American Chemical Society, the New York and Connecticut Rubber Groups and the American Institute of Chemical Engineers. He holds numerous patents pertaining to the manufacture of rubber chemicals, reclaimed rubber, Lastex yarn and rubber thread.

Calendered Unsupported Vinyl Film

Ross & Roberts, Inc., Stratford, Conn., has announced the availability of .002-inch calendered unsupported vinyl film. This is said to be the first time that a .002-inch calendered unsupported vinyl film has been offered on a commercial scale. In the experimental stage for several months, its manufacture was finally made possible by new developments in calendering techniques and equipment, the company said. This new development makes it possible to enjoy the economy of a thin film while still retaining the advantages of a calendered product. It is available in a variety of colors. Distribution is being handled through Ross & Roberts Sales Co., Inc., 350 Fifth Avenue, New York 1, N. Y.

ONTARIO GROUP HEARS EMMERSON ON PETRO-CHEMICALS PROCESSING

Approximately 60 members and guests of the Ontario Rubber Section of the Chemical Institute of Canada attended the dinner meeting held on November 14 at McMaster University, Hamilton, Ont., Canada. Principal speaker of the evening was H. R. Emmerson, technical superintendent of the Polymer Corp., Ltd., Sarnia, Ont., Canada. Mr. Emmerson described the chemistry of the processing of the petro-chemicals leading to the manufacture of GR-S and butyl rubber.

The production of the original monomers is complex but the chemistry involved is better understood than that dealing with actual polymerization, the speaker stated. He described the division of the main stream of non-condensable gases originating from thermo-cracked petroleum into its five categories, C1, C2/C3, C4 and C5 groups. Certain of these groups are burned but the remainder are subjected to further processing, such as distillation, azeotropic distillation, alkylation and dehydrogenation, to give butadiene, styrene, isobutylene and isoprene which are the raw monomers for the production of GR-S and butyl.

The next meeting of the group was to have been held on December 12 at the University of Toronto in Toronto, Ont. The meeting was to have been addressed by Dr. C. E. Coke of Courtaulds (Canada) Ltd., and by Dr. G. B. Quig of E. I. du Pont de Nemours & Co. The talks were to constitute a symposium on synthetic fibres with Dr. Coke speaking about rayon and Dr. Quig offering a comparison of Nylon, Terelyne and Orlon.

Anti-Trust Judgment Entered

An anti-trust consent judgment against the four largest manufacturers in the coated abrasive industry was entered by the Attorney General of the United States in Washington, D. C., on November 6. The judgment is against the Minnesota Mining & Manufacturing Co., the Carborundum Co., Armour & Co., and the Behr-Manning Corp. The defendants are required by the judgment to license their existing coated abrasive patents and patent applications to any applicant. They must also do the same with any such patent rights they acquire during the next five years. More than 200 existing patents become subject to compulsory licensing as a result, said the Department of Justice. The department said the purpose of the compulsory licensing is "to create opportunities for the entrance of new competitors in the industry and to dissipate the effects of the defendants' patent abuse."

Acquires Thermoid 3.40% Notes

Massachusetts Mutual Life Insurance Co. has acquired $2,500,000 of the 3.40% promissory notes of the Thermoid Co., Inc., Trenton, N.J. The Connecticut Mutual Life Insurance Co. has taken $1,500,000 of the issue. The $4,000,000 issue of the notes, due 1965, were sold at par. Financing was arranged through Blyth & Co., Inc., New York, N.Y.

NO. CALIFORNIA HEARS ADDRESS ON RUBBER IN HIGH VACUUM USE

Approximately 40 members and guests attended the November 16th meeting of the Northern California Group held at the Elks Club in Berkeley, Calif. Principal speaker at the meeting was W. C. Twitchell of the Radiation Laboratory of the University of California.

In his address on "Rubber Products in High Vacuum Service," Mr. Twitchell said that the first Cyclotron was constructed in 1930 with a glass vacuum tank sealed with wax. As these atom smashers were made larger, brass replaced glass as the tank material, and solder was used for most joints. The removeable sections were still joined with sealing wax.

By 1935 the leak problem with wax joints was so serious that the major step to rubber gaskets was necessary. Round rod in round grooves led to round rod in square grooves and finally to square rod in square grooves. This arrangement was improved by providing space adjacent to the groove for the gasket to be squeezed into, allowing cover plates and flanges to be joined metal to metal. This permitted control of the gasket compression, which is standardized at 30 per cent, asserted the speaker.

The rubber properties of most interest to the vacuum engineer are low vapor pressure, low compression set, and oil resistance. Neoprene and the Hycar compounds are generally used. For special applications, the Radiation Laboratory now uses Silastic rubbers and Teflon. A new material called Myvaseal, supplied by DPI, is currently being tested. It is claimed to have very low vapor pressure and should be very good for vacuum systems operating at pressures below a thousandth of a micron.

A number of special gasket applications are found in the various vacuum systems at the Radiation Laboratory. One of these is a gasket molded to both sides of a 1/16-inch steel ring for use with ASA standard pipe flanges. This construction provides all of the convenience of flat sheet gaskets, and by providing narrow bands of rubber around the central hole insures adequate unit pressures to give a vacuum tight seal. No gasket grooves are required, Mr. Twitchell said.

Philadelphia Group Hears Ellis

The Philadelphia Rubber Group held its Fall Meeting on November 10 at the Poor Richard Club in Philadelphia, Penna., with approximately 80 members and guests in attendance. The speaker for the evening was W. T. Ellis, metallurgist for the Waukegan Works of the American Steel and Wire Co., Waukegan, Ill. Mr. Ellis gave a brief introductory lecture on the making and processing of steel before showing two sound movies entitled "Steel —Man's Servant". The movies illustrated in detail all the processes involved in making finished steel products, such as wire, sheets, tubes, beams and wheels. From mining to ore to inspection of the finished product, the films gave a graphically spectacular story of steel.

Progress on Division Meeting

Plans are rapidly being formulated for the 58th Meeting of the Division of Rubber Chemistry of the American Chemical Society, which will be held at the Shoreham Hotel in Washington, D. C., on February 28, March 1 and 2, 1951. The Washington Rubber Group is sponsoring the meeting, with Norman Bekkedahl (Bureau of Standards) acting as general chairman. The 25-Year Club will hold a luncheon at noon on February 28 under the chairmanship of Harry L. Fisher (National Research Council). The divisional banquet will be held on the evening of March 1, with John T. Cox, Jr., in charge. In view of the early date for the meeting, which is necessary to avoid conflict with the Spring meetings of the ACS, a deadline for abstracts of papers has been set for January 10. As usual, these must consist of 400 words, sent to C. R. Haynes, secretary of the division, in triplicate. Three copies of the completed manuscript must be available at the time of the meeting.

Chicago Holds Management Night

"Management Night" was the feature of the November 17th meeting of the Chicago Rubber Group held at the Morrison Hotel in Chicago, Ill. Principal speaker of the evening was Gordon L. Hostetter, executive vice-president of the Employers Association of Chicago. Mr. Hostetter spoke on the subject "Human Liberty". Approximately 125 members and their guests heard the speaker point out the current trends towards socialism in the United States. Mr. Hostetter observed that when taxation rises above 20%, a country is headed toward socialism. Taxes in the United States, he said, average 30%. He also noted that the Government has increased its control over utilities by 580% in the last five years.

CONNECTICUT GROUP VISITS FARREL-BIRMINGHAM PLANTS

Approximately 125 members of the Connecticut Rubber Group participated in the November 10th meeting which consisted of a visit to the Ansonia and Derby, Conn., plants of the Farrel-Birmingham Co. The tour was arranged to terminate with a gathering of all the visitors at the company's process-testing laboratory at Derby.

Here, production and sales engineers, headed by Carl F. Schmuck, director of engineering for the company, answered many questions put to them by the Connecticut group members. Many members were introduced for the first time to the critical engineering and construction problems of rubber processing equipment.

Comments from the group members indicated that the tour was particularly instructive as the visitors first saw several types of machines and machine parts in various stages of construction in the plants, and then, in the laboratory, were able to examine complete modern units in both laboratory and production sizes, some of which were put into operation.

Special interest was centered on a reclaim test which converted shredded whole tire into quality reclaim by patented treatment in a Banbury mixer, using exceptionally high ram pressures and rotor speeds.

Moves Headquarters to Akron

Headquarters of A. Schulman, Inc., have been moved from New York City to 790 East Tallmadge Avenue, Akron, Ohio, adjacent to its Akron plant. The firm had established its headquarters in New York about one year ago, but decided to move back to Akron. The company will continue to maintain its New York offices at 500 Fifth Avenue. It also has offices in Boston, Mass., East St. Louis, Ill., and Long Beach, Calif.

Members of the Connecticut Rubber Group are shown above examining the Process Testing Laboratory of the Farrel-Birmingham Co. at Derby, Conn.

NAMES IN THE NEWS

DR. MAX LUTHY has been elected vice-president in charge of production and research for Givaudan-Delawanna, Inc., New York 18, N. Y.

J. WARD KEENER, vice-president of the B. F. Goodrich Co., has been selected to serve as one of the three management representatives on the nine-member, tripartite Wage Stabilization Board to settle wage disputes under provisions of the Defense Production Law.

MIKE FIRSTENBERG, president of the Chemical and Process Machinery Corp., and former all-star tackle of New York University, has been named chairman of the Machinery, Motors and Equipment Division of the Federation of Jewish Philanthropies of New York.

C. DEAN LAMPMAN, associated with the General Tire & Rubber Co. since 1933, has been named manager of sales promotion, succeeding A. RAY CARR who was recently made manager of Kraft Service and Accessory Sales.

RUTH A. MAURER, formerly plant purchasing agent for the Rome, N. Y., plant of the General Cable Corporation, has been transferred to the New York headquarters of the company as purchasing agent.

HARVEY S. FIRESTONE, JR., chairman of the Firestone Tire & Rubber Co., was one of eleven men named recently to a board charged with supervising developments under the Government's Point Four Program.

WILLIAM GERICKE, formerly rubber technician at the St. Louis, Mo., plant of the General Cable Corp., is now with the U. S. Army Signal Corps at Fort Monmouth, N. J. He has been succeeded at St. Louis by Edward Hunt.

ALVIN FUHRMANN, for many years sales manager of the Midwest Rubber Reclaiming Co., recently resigned from that company to accept a sales executive position with the Adhesives and Coating Division of the Minnesota Mining & Manufacturing Co. at Detroit, Mich.

ALBERT S. SILVER, associated with various rubber concerns in the Metropolitan New York area for the past few years, has joined the Royal Electric Co., Pawtucket, R. I., as chief chemist. He will be in charge of compounding of rubbers and plastics for electrical insulation and jacketing problems.

EDWIN F. PIERCE, associated with the Goodyear Tire & Rubber Co. since 1926 and formerly superintendent of the rim plant at Akron, has been named superintendent of plant maintenance and machine shops for the company's Akron factories, succeeding the late ELMER CLARK.

W. G. BERNEL, formerly manager of production control for the Goodyear Tire & Rubber Co. at Plant C in Akron, has been appointed manager of the Mechanical Goods Merchandise Distribution Department in Los Angeles, Calif., replacing K. D. LOGAN, who has resigned.

WILEY LEROY JENNINGS, sales manager of the West Virginia Pulp and Paper Co., has been elected a vice-president and a director of the company, filling a vacancy on the board of directors caused by the death of SIDNEY M. PHELAN, JR., late senior vice-president and director.

HAROLD KILLAM, formerly associated with the Dewey & Almy Chemical Co. and the Union Paste Co., has been appointed director of technical service for the American Polymer Corp. of Peabody, Mass.

ANDRE BLUMENTHAL, vice-president of Sidney Blumenthal & Co., New York 16, N. Y., has been elected president of the Textile Research Institute, Princeton, N. J. H. GORDON SMITH, of the Textile Division of the U. S. Rubber Co., has been elected vice-president.

VINCENT W. SUELLAU, associated with the General Chemical Division of the Allied Chemical & Dye Corp. for the past 30 years, has been appointed director of sales for the division succeeding CHESTER M. BROWN, who recently was appointed a vice-president.

J. C. BAKER, formerly associated with the Ohio Rubber Co., has joined the Castle Rubber Co., East Butler, Penna., as chief chemist.

EDWIN J. FITZPATRICK, who joined Johnson & Johnson in 1933, has been named president of the Industrial Tape Corporation, New Brunswick, N. J., a wholly-owned subsidiary. He succeeds J. S. NICHOLLS, JR., who has been made chairman of the board.

ALPHONSE PECHUKAS, formerly director of research for the Columbia Chemical Division of Pittsburgh Plate Glass Co., has been named engineering manager for the Chemicals Division, General Electric Co., Pittsfield, Mass.

JOHN H. DEHAMM, associated with the Replacement Sales Shoe Products Division of the B. F. Goodrich Co. for the past 20 years, has been appointed special representative for the Shoe Manufacturers' Sales Department with headquarters at Akron, Ohio.

D. HASKELL SMITH, formerly chief chemist of the Castle Rubber Co., East Butler, Penna., has been appointed to the staff of the Materials Research Department of the Lord Manufacturing Co., Erie, Penna.

RALPH H. MINER, assistant secretary of the Goodyear Tire & Rubber Co., was recently elected a vice-president of the Ohio Manufacturers Association at its annual meeting.

SAM M. LEE, formerly personnel manager of the Tree-Sweet Products Co., Santa Ana, Calif., has been appointed personnel director of the Rubber Corporation of Calif., Garden Grove, Calif.

JOSEPH A. CONLON, formerly district sales manager for the Chicago Branch of the Mechanical Goods Division of the U. S. Rubber Co., has been named manager of allied sales for the division with headquarters in New York.

FRANK R. CREEDON, at one time deputy rubber director in charge of construction for the synthetic rubber program of ORR, has been named to organize a Facilities Clearance Staff within the National Production Authority.

ELMER H. WHITE, vice-president of the U. S. Rubber Co., has been elected a director and a member of the executive committee of the company.

ROBERT A. TOBIAS, formerly director of marketing for the H. D. Hudson Manufacturing Co. of Chicago, Ill., has been named to the new post of general sales manager of the Sloane-Blabon Corp.

DENIS F. MULVIHILL, vice-president, formerly in charge of production for Texon, Inc., South Hadley Falls, Mass., has assumed control of all sales activities of the company, succeeding J. WARREN HEFFNER, whose resignation as vice-president in charge of sales becomes effective at the end of 1950.

DAVID JUELSS, for the past 15 years chief engineer of the American Lead Pencil Co., Hoboken, N. J., has been appointed technical director of the firm.

LEE WATERMAN, formerly vice-president of the W. T. Grant Co., has been named executive vice-president of the Sloane-Blabon Corp.

WILLIAM A. HAMOR, assistant director of the Mellon Institute, Pittsburgh, Penna., has been named by the Pittsburgh Section of the American Chemical Society to receive its Pittsburgh Award for the year 1950.

CAPT. M. L. CUSHING, laboratory director of Stein, Hall & Co., has been recalled by the Chemical Corps and has been assigned as chief of the organic branch, chemical division, Technical Command, Army Chemical Center, Maryland.

F. E. CONDON, of the Phillips Petroleum Co., has been transferred from Bartlesville, Oklahoma, to the rubber research laboratory at Phillips, Texas.

J. DUNCAN WEBB, formerly treasurer of U. S. Rubber Export Co., Ltd., New York, N. Y., has been elected controller of Dan River Mills, Inc.

Fuller Retires From Pequanoc

Harold P. Fuller

Harold P. Fuller, associated with the Pequanoc Rubber Co., Butler, N. J., since 1934, has retired from active duty with the company effective October 31, 1950. Mr. Fuller had been closely associated with the sale of reclaimed rubber for over 46 years. He was vice-president of the E. H. Clapp Rubber Co. for many years, and from 1934 until his retirement was New England representative for Pequanoc. His many friends will be happy to know that he is retiring in excellent health, and that he plans to continue his association with them at the various rubber group meetings in the Boston area. Mr. Fuller will also retain his affiliation with Pequanoc in a consulting capacity.

Promotions at Mohawk Rubber

Promotion of George A. Evans as service manager, and W. C. Seidel as manager of the Order Department, was recently announced by the Mohawk Rubber Co., Akron 5, Ohio. Mr. Evans joined the company three years ago. Before that, he had 11 years' experience in the rubber and transportation fields as an industrial engineer. Mr. Seidel has been with Mohawk for five years, and during this time was in charge of inventory control, foreman of warehousing and for the last two years was assistant to the traffic manager. In another promotion, Harold J. True, service manager for the past three years, was appointed assistant credit manager.

Sun Rubber Bars "Scare Orders"

The Sun Rubber Co. of Barberton, Ohio, a major producer of rubber toys, has notified its customers that it cannot handle heavy "scare orders" because of the Government's moves to conserve rubber. It requested buyers to order only items needed for current demand and early spring selling. Present production is adequate to take care of regular customers "on a fair and sensible basis," the company said. Present price levels are guaranteed only until December 31.

General Tire (Israel) Formed

Certification of incorporation has been granted the General Tire & Rubber Co. (Israel) Ltd., by the Israeli Government. The authorized capitalization of the company is one million Israeli pounds. Stock in the company is shared by a combination of American and Israel capital. In addition to the General Tire & Rubber Company of Akron, Ohio, the principal American investors include Sidney Albert, of Akron, Ohio, the Palestine Economic Corporation, of New York, and a group of New Yorkers headed by Isaac Shalom. General Tire engineers are now in Israel doing the preliminary ground work and shipment of machinery and other necessary equipment is now being readied. Barring unforeseen delays, the factory should be completed to begin production late in 1951. The factory will produce tires, tubes, and allied rubber products for distribution in Israel. All production will be under the direction of General Tire and the products will carry the General trademark.

Organize Naftone, Incorporated

E. M. Pflueger and C. A. Klebsattel, formerly vice-president and technical director, respectively, of the Advance Solvents & Chemical Corp., have resigned their positions after twenty years with that company and have organized Naftone, Inc., at 745 Fifth Ave., New York 22, N.Y. The new company will deal in the chemical products of various manufacturers and will specialize in raw materials used by the rubber and paint industries. Both men have long backgrounds of association with these industries, and plan on giving their many friends personal attention in handling orders and furnishing technical service. The phone number of Naftone, Inc., is PLaza 3-2893.

Joins Stein, Hall & Co.

W. J. R. Hauser

W. J. R. Hauser, who terminated his association with the Heveatex Corp., Melrose, Mass., several months ago, has been appointed manager of the Latex Products Department of Stein, Hall & Co., Inc., and will make his headquarters at their New York office at 285 Madison Avenue.

Brands Joins Olin Laboratories

George B. Brands

George B. Brands, formerly associated with the Rubber Section of the Research Laboratories of the Armstrong Cork Co., Lancaster, Penna., has joined the R. R. Olin Laboratories at Akron, Ohio, as an associate consultant. Mr. Brands was graduated from the University of Akron where he also did graduate work. He also did graduate work at Franklin & Marshall College and the Massachusetts Institute of Technology. Mr. Brands served in the United States Army for three years during World War II. He is a member of the American Chemical Society, the Akron Rubber Group, the Philadelphia Rubber Group, and the Lancaster branch of the American Association for the Advancement of Science.

Named Hycar Representative

The appointment of Frank Bell as staff representative for Hycar rubbers was recently announced by the B. F. Goodrich Chemical Co., Cleveland 15, Ohio. A graduate of Case Institute of Technology in 1931 with a B. S. degree in chemical engineering, Mr. Bell served as chief chemist for the Bolta Co. from 1936 to 1940, and as chemical sales representative for the Barrett Division of Allied Chemical & Dye Corp. from 1940 to 1944. He joined the Hycar Chemical Co. as technical sales representative in 1944, and continued in that capacity after the company was purchased by Goodrich in 1945. Early in 1949 he was transferred to agricultural chemical sales where he had been senior sales representative. Mr. Bell is a member of the American Chemical Society and the Akron Rubber Group.

Powdered Material Changes Name

Powdered Material Research Laboratories, formerly located at Cambridge, Mass., have announced a change in company name to Lukens Laboratories, and a new address at 277 California Street, Newton 58, Mass. Lukens Laboratories have considerably increased facilities for the testing of pigments and powders compounded into rubber, plastics, paint, etc. Telephone number of the company is BIgelow 4-3966.

FINANCIAL NEWS

Dewey & Almy Chemical Co.

First Nine Months: Net income of $1,421,433, which is equal to $4.44 a common share, compared with $556,160, or $1.74 per share, in the first nine months of 1949. For the third quarter ended September 30, 1950, the net income amounted to $741,663, which is equal to $2.32 a common share, against $381,407, or $1.19 a share, for the same quarter of 1949. Net sales for the first nine months of 1950 reached an all-time high of $15,482,804, representing a gain of 27% over the same period of 1949, when sales were $12,183,853. Net sales for the third quarter of 1950 totaled $6,479,313 against $4,737,777 for the third quarter of 1949. In a report mailed to stockholders, figures for the 12 months period ending September 30, 1950, show net earnings of $1,841,766, equal to $5.76 a common share, on sales of $19,595,952, as compared to earnings of $976,493, or $3.05 a common share, on sales of $16,297,002 for the calendar year of 1949.

U. S. Rubber Co.

First Nine Months: Net income of $15,857,158, which is equal to $6.79 a share after allowing $2,500,000 for contingencies, compared with $8,619,600, or $2.68 a share after providing for a preferred dividend in the first nine months of the preceding year. Net sales for the first nine months of 1950 were $487,136,916, highest in the company's history and an increase of 22.8% over sales of $396,551,121 recorded in the corresponding period of 1949. Earnings were 3.3% of sales compared with 2.2% last year. In the third quarter of 1950, sales were $195,858,210, compared with $138,248,207 in the third quarter of 1949. Net earnings in the third quarter of 1950 were $7,008,401, which is equal to $3.24 a share, against $1,964,590, or 38c a share, in the third quarter of the previous year.

Columbian Carbon Co.

First Nine Months: Net income of $4,342,750, which is equal to $2.69 each on 1,612,218 capital shares, compared with $4,621,475, or $2.87 each on an equal number of shares, in the first nine months of 1949. Sales in the first nine months of 1950 amounted to $35,686,117, against sales of $28,348,509 in the first nine months of the preceding year. Balance sheet items of the company as of September 30, 1950, reveal current assets of $21,556,512 and current liabilities of $5,944,845, contrasted with $18,095,318 and $4,501,209, respectively, as of September 30, 1949.

O'Sullivan Rubber Corp.

First Nine Months: Net profit of $136,250, which is equal to 28c a common share on net sales of $4,142,093, contrasted with a loss of $29,274 on sales of $2,798,570 in the first nine months of 1949.

B. F. Goodrich Co.

First Nine Months: Net income of $21,967,990, which is equal to $15.61 a common share, compared with $12,451,690, or $8.34 a share, in the first nine months of 1949. Consolidated net sales for the first nine months of 1950 totaled $389,099,197, against $283,393,796 for the first nine months of the preceding year. The estimated net income is after Federal and foreign income taxes and after providing reserves of $3,000,000 for increased replacement cost of facilities and $5,000,000 for price declines of materials. The net for the 1949 period was after a $3,000,000 reserve for increased cost of facilities. Directors of the company have increased total dividends on the common stock this year to $6.50 from $5.50 distributed in 1949 with the declaration on November 21 that a year-end dividend of $2.50 a share in addition to the quarterly dividend of $1 would be payable on December 30.

United Carbon Co.

First Nine Months: Net income of $2,496,503, which is equal to $3.14 each on 795,770 capital shares, contrasted with $1,971,727, or $2.48 each on an equal number of shares, in the first nine months of 1949. Balance sheet items of the company as of September 30, 1950, indicate current assets of $11,536,927 and current liabilities of $2,827,622, against $11,396,201 and $2,949,566, respectively, as of September 30, 1949.

General Cable Corp.

First Nine Months: Net profit of $1,254,081, which is equal to 36c each on 1,917,646 common shares, compared with $1,277,681, or 37c each on an equal number of shares, in the first nine months of the preceding year. For the six months ended June 30, 1950, net profit was $727,000, which is equal to 18c a common share, contrasted with $1,159,905, or 41c a common share, in the first half of 1949.

Anaconda Wire & Cable Co.

First Nine Months: Net income of $2,690,021, which is equal to $3.19 each on 843,962 capital shares, compared with $2,404,401, or $2.85 each on an equal number of shares, in the first nine months of 1949. For the six months ended June 30, last, net income was $1,927,049, which is equal to $2.28 a share, contrasted with $1,722,383, or $2.04 a share, in the first half of the previous year.

Raybestos-Manhattan, Inc.

First Nine Months: Net profit of 2,598,386, which is equal to $4.14 a share, compared with $1,162,556, or $1.85 a share, for the first nine months of the preceding year. Figures include the domestic subsidiaries of the company.

Thermoid Company

First Nine Months: Net profit of $1,068,062, which is equal to $1.29 a common share, compared with $481,412, or 50c a share, in the first nine months of 1949. Figures for the September quarter indicate a net profit of $363,765, which is equal to 44c a common share, contrasted with $61,834, or 4c a share, in the September quarter of the preceding year.

American Hair & Felt Co.

First Nine Months: Net profit of $830,846, which is equal to $4.74 a common share on net sales of $9,481,107, compared with $202,639, or 75c a common share, after deducting actual inventory losses of approximately $609,000 resulting from market price declines, in the first nine months of the preceding year.

Minnesota Mining & Mfg. Co.

First Nine Months: Net profit of $16,890,590, which is equal to $8.38 a common share, compared with $9,942,407, or $4.89 a share, in the first nine months of 1949. Net profit in the September quarter amounted to $7,774,201, which is equal to $3.88 a common share, against $3,612,179, or $1.78 a share in the September quarter of the preceding year.

Okonite Corporation

First Nine Months: Net profit of $693,987, which is equal to $5.06 a common share. In the September quarter, net income totaled $387,465, or $2.83 a common share. Comparisons with last year are not available.

Cooper Tire & Rubber Co.

First Nine Months: Net profit of $305,964, which is equal to $1.95 a common share on net sales of $8,878,317, compared with a loss of $183,283 on sales of $4,313,605 in the same period of the previous year.

Pantasote Company

First Nine Months: Net income of $125,667, contrasted with a loss of $70,799 last year. In the September quarter, net income amounted to $122,846, against a net loss of $1,193 a year ago.

Sheller Manufacturing Co.

First Nine Months: Net income of $3,398,936, which is equal to $3.07 a common share, compared with $2,910,600, or $2.61 a share, in the first nine months of 1949.

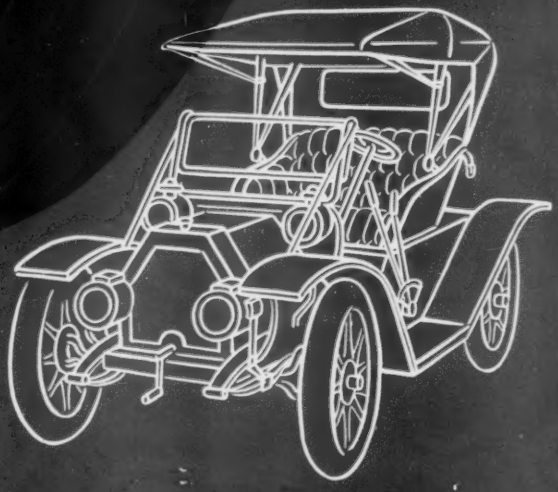
New Jersey Zinc Co.

Third Quarter: Net income of $3,372,997, which is equal to $1.72 a share, compared with $408,506, or 21c a share, in the third quarter of the previous year.

U. S. Testing Co. has announced the installation of additional vibration testing equipment to its Environmental Testing Station.

Even then...

...our black pioneered in rubber reinforcement



• COLUMBIAN COLLOIDS •

COLUMBIAN CARBON CO. • BINNEY & SMITH CO.

MANUFACTURER DISTRIBUTOR

40 Years of Carbon Black Progress

In 1910 and 1911, when the first experiments involving Carbon Blacks in rubber compounds were begun in Akron, we supplied the blacks.

As the reinforcing qualities of Channel Blacks became better understood the industry looked to us for what then seemed a fabulous supply. We met the demand.

MICRONEX, the channel black developed to satisfy the ensuing needs of the industry, was soon known as the "King of Rubber Blacks." Since then other grades have been developed, including the comprehensive STATEX line of Furnace Blacks. Each grade has been engineered to meet a specific need, for tires, mechanicals, footwear and other rubber products.

Today the demand for all types of blacks is greater than ever. We are planning accordingly.

COLUMBIAN CARBON CO. — MANUFACTURER

BINNEY & SMITH CO. — DISTRIBUTOR

Bacon Silastic Rubber O-Rings

Frederick S. Bacon Laboratories of Watertown, Massachusetts, are now manufacturing precision O-rings that provide hydraulic seals resistant to petroleum oils and most hydrocarbons, and which display outstanding efficiency under static conditions at either high or low temperatures. Available at present in semi-commercial quantities and in a limited number of small sizes, the O-rings are molded from a mixture of silicone rubbers more resistant to deformation under compression than either natural or other synthetic rubbers, and which are claimed to retain flexibility even at temperatures of —65° F. and lower. The O-rings are manufactured to the following specifications: tensile strength greater than 500 psi; percentage elongation at break greater than 80%; A_2 shore hardness 70-75; swell in fluorocarbons, Aroclors and petroleum oil, less than 6%; compression set less than 10% when under 30% compression for 22 hours at 300° F. (i.e., less than 33% at 300° F. by ASTM 395-46T Method B).

Flintkote No. 704 Adhesive

Case liner adhesives conforming to Joint Army and Navy Specification JAN-P-140 are now being offered by the Industrial Products Division of the Flintkote Company, 30 Rockefeller Plaza, New York 20, New York. These adhesives meet the specifications both for strength, mold and fungi resistance and water resistance in use with triplex creped or triplex and pleated barrier materials (as in Type 1), and duplex uncreped, coated, saturated or asphalt infused sheets (Type 2). Flintkote No. 704 is compounded for slow and fast tack range as required in the specification A and B grades. Thus, these adhesive products fill the needs of military depots and contractors who supply the armed services. They are applied as seam sealers and closures for waterproof paper bags, wrap and case liners.

Building New Rubber Laboratory

The Natural Rubber Bureau, which maintains headquarters in Washington, D.C., is building a rubber laboratory in Arlington, Va., just across the Potomac River. The major purpose of the new laboratory will be devoted to the problem of rubber in roads. It will be equipped to handle tests on all types of rubber—natural, synthetic, reclaim and scrap—for road paving purposes. The laboratory, which is expected to be in operation by mid-January, will be headed by Harry K. Fisher, consulting civil engineer who is directing the rubber roads program of the Natural Rubber Bureau.

I.R.I. Preparing Monographs

The Institution of the Rubber Industry, of England, is sponsoring three monographs which it expects to issue during 1951. One of these will be on "Pneumatic Tire Design," which is being prepared by E. C. Woods of the John Bull Rubber Co., Ltd. The second will be on "Calenders" and the third on "Aging."

Goodrich Produces Mammoth Belt

What is said to be the largest conveyor belt ever built and shipped in a single roll is shown herewith after work on it was completed in the new $5,000,000 belt plant of the B. F. Goodrich Co. in Akron, Ohio. First major product of the new plant, the belt weighs 45,000 pounds, is 48 inches wide, and the roll of belting is 15 feet high. Designed by Goodrich engineers for the Baltimore & Ohio Railroad, the belt will bring ore from ship to shore at the railroad's new dock in Baltimore, Md.

Latex and Hide Fusion Process

A new process has been discovered in France for fusing latex and cattle hide before tanning in the production of sole and industrial leathers. The fusion method, as contrasted with the usual procedure of filling in leather with latex or putting a layer of latex on top of the leather, is said to increase the yield, reduce tanning time by 1 month, give greater resistance to wear, and provide respiration properties equal to those of ordinary leather. Production costs may also be lowered by about 15 percent, the inventor of the process believes. Synthetic latex is considered more satisfactory for use in the new process. Leather is now being made under the process, but not on a commercial scale.

Active in Rotary Circles

Kurt H. Stubenvoll, product control manager of the Eau Claire, Wisc., plant of the U.S. Rubber Co., who has long been active in Rotary affairs, was recently elected a District Governor of Rotary International for 1950-51. As Governor, he will coordinate the activities of some 50 Rotary Clubs in parts of Wisconsin and Michigan, and during the year he holds office will visit each of the clubs to offer advice and assistance in Rotary service work and administration. Mr. Stubenvoll, who is a past president of the Rotary Club of Eau Claire, has been active in the rubber industry as a chemical engineer for the past 33 years. He is a member of both A.C.S. and A.S.T.M.

New Polyvinyl Acetate Resins

American Polymer Corp., Peabody, Mass., has announced the availability of three new polyvinyl acetate resins. The first of these is Polyco 369, said to be the first high viscosity polyvinyl acetate emulsion manufactured by controlling polymerization conditions, and not by the addition of extraneous thickening agents which lower water resistance. The second of the new resins is Resin Emulsion 1040-14B especially designed for the adhesives industry. This product has excellent particle size, fair water resistance, good mechanical stability and dries to a clear film. It is also suited for the manufacture of textile finishes and paper coatings. The last of the new polyvinyl acetate resins is Polyco Resin 953-7A which has been especially designed for the textile finishing industry. American Polymer states that this product is unmatched for its wash resistant and stiffening properties. It is also a versatile medium in compounding textile finishes and paper coatings.

Cat's Paw Rubber Cited

Price discrimination in the sale of rubber heels, soles and other shoe repair products was charged by the Federal Trade Commission in a complaint issued on November 16 in Washington, D. C., against the Cat's Paw Rubber Co., Inc., and its parent concern, the Holtite Manufacturing Co., both of Baltimore, Md. Two Chicago, Ill., firms were also named in the complaint, A. Leveton Co. and K. Kaplan Sons & Co., both wholesalers of shoe repair materials and shoe findings. Cat's Paw, the FTC alleged, discriminates in price by selling rubber heels, soles and shoe findings "to some of its customers at substantially higher prices than it sells such products of like grade to others of its customers." This is done through discounts, rebates, and allowances on sales to favored customers, particularly large chain repair shops.

World's Largest "Garden Hose"

U. S. Rubber Co. has developed what is said to be the world's largest "garden hose" to water pineapples in Hawaii. The hose is 4 inches in diameter, will carry more than 700 gallons of water per minute, is 800 feet in length and requires a hose reel 8 feet in diameter to carry it. The hose is constructed with a rubber tube and cover and 4 plies of chemically treated cotton yarn which makes it strong yet light and flexible. It operates at a working pressure of 125 pounds per square inch. The hose is being used, in conjunction with a mobile spray rig, on the 14,000-acre pineapple plantation of the Dole Hawaiian Pineapple Co., on the island of Lanai, Hawaii.

Form Shep Rubber Mfg. Co.

Shep Rubber Manufacturing Co. has been established in St. Louis, Mo., for the manufacture of custom molded rubber products. Operations have already begun at 2556 West Sullivan Avenue. C. P. Sheppard is president of the new firm.

NAITD HEARS INDUSTRY LEADERS DISCUSS CURRENT RUBBER SCENE

Approximately 1,500 members of the National Association of Independent Tire Dealers attended the 30th annual convention of the organization held in Chicago, Ill., on November 7 and 8. Besides clinics and conferences on all phases of tire retailing, members of NAIDT heard a number of interesting addresses by rubber industry executives and public officials. The convention's keynote address was delivered by Senator Paul Douglas (Dem., Ill.) who discussed the problems of the small business man.

Other public figures who addressed the convention included Earl W. Glen, chief of the Rubber Division of the U. S. Depart of Commerce. Mr. Glen said that the National Production Authority's cutback in the consumption of new rubber "should leave reasonably adequate supplies of rubber end products available to sustain the essential needs of the national economy while focusing attention on the defense needs of the country."

Declaring that the watchword in rubber was "conserve," Mr. Glen deplored the uncommonly high consumption of rubber immediately after the outbreak of war in Korea in July and August. "It may be later than we think, in rubber," he warned, commenting on the communist-supported "sustained wave of banditry and lawlessness" throughout the rubber producing areas of Southeast Asia. Mr. Glen disclosed that synthetic rubber production was 10,000 long tons a month less than it might be, on account of an acute shortage of feedstocks, notably styrene and butadiene.

Collyer Presents Plan

In another address before the NAITD convention, John L. Collyer, president and chairman of the board of the B. F. Goodrich Co., proposed a seven-point program by which the United States might attain security in respect to rubber. Mr. Collyer recommended:

(1) Rapidly increasing the output of synthetic rubber from the current rate of 570,000 tons a year up to the authorized rate of about 920,000 tons.

(2) Increased usage of synthetic rubbers as rapidly as they become available.

(3) Add any excess production of synthetic rubbers to the Government's working inventory, up to a reasonable limit, as protection against damage or dislocation of rubber-producing facilities.

(4) Government to exchange with foreign countries any remaining excess production of synthetic rubbers for natural rubber.

(5) Government should make efforts to prevent sales of natural rubber to Russia. Purpose of the present limitation program placed on consumption of natural rubber in the United States is to make more natural rubber available for our own strategic stockpile.

(6) Government to accumulate natural rubber in the strategic stockpile but only to the extent justified by a careful study of our probable military and essential civilian requirements for an extended emergency. A study should be made of the possible effect upon the economics of our own and other nations if we accelerate our stockpile purchases rapidly and then cut them off abruptly.

(7) Congress should complete a study promptly on the question of whether the continuance of the present Government monopoly in general and special purpose synthetic rubbers is in our long-range national security interests.

Mr. Collyer, who served the Government as special director of rubber programs in World War II, said that rubber consumption in the United States in 1951 might hit an all-time high of 1,200,000 tons. The Goodrich head said the rolling stock of rubber on wheels of vehicles now in use is probably at the highest point in our history.

Litchfield Offers Comments

Paul W. Litchfield, chairman of the board of the Goodyear Tire & Rubber Co., writing for the annual yearbook of the National Association of Independent Tire Dealers, stated the rubber business occasionally suffers because its deep significance and complexity are so little known. Tire dealers, he said, will get more satisfaction out of their jobs by probing beneath the surface of the rubber picture for complete understanding.

Mr. Litchfield stated that we find ourselves facing two urgent facts. "Our source of supply is precarious (90% of our supply of natural rubber is half-way around the world and most of this growing area is in an acute state of political and economical turmoil) and our need for and dependency upon rubber, both militarily and economically, is constantly increasing."

Obvious answers in Mr. Litchfield's opinion are capacity production by Government-owned synthetic rubber plants and the building up of an inventory or stockpile of synthetic rubber to a minimum of 200,000 long tons. In this period of acute crisis, he asserted, economic and military, direction and operation of these facilities call for close integration which can be had only under continuing Government ownership.

Other speakers heard at the NAITD conference in Chicago included J. C. Ray, sales manager for dealer brands of the U. S. Rubber Co., and Walter W. Belsen, director of public relations for the American Trucking Association. The conference also featured an election of officers in which David R. Lehman, a Seiberling dealer of Washington, D. C., was elected president of NAITD for 1951.

Record Tire Sales Due

Conference attendees heard the prediction that despite rubber allocations the tire and rubber industry is headed for a record $3,500,000,000 sales year in 1950, approximately 15% more than in the preceding year. Unit production tires, biggest money maker for the industry, may also set a new record.

The industry reached its previous production peak in 1947 when 77,795,000 casings were produced. This year the companies will come close to that mark, it was said, and they have an outside chance of beating that record. In 1949, output totaled 65,140,000 units. The high sales level this year is especially noteworthy as all companies both large and small are sharing in the prosperity. What is more, substantial profit margins are being reported by all companies.

General Aniline & Film Corp. has announced the availability of butynediol, a derivative of acetylene which finds use as a vinyl polymerization accelerator.

Shroyer Transferred by Vanderbilt

J. R. "Bob" Shroyer

J. R. "Bob" Shroyer, who has been associated with the sales staff of the R. T. Vanderbilt Co. since October, 1941, with headquarters at Detroit, Mich., has been transferred to the company's laboratories at East Norwalk, Conn. His new duties will include supervision of chemical production and development work in connection with the chemical fields in which the R. T. Vanderbilt Co. is interested. Prior to joining Vanderbilt, Mr. Shroyer spent ten years with the Inland Manufacturing Division of General Motors at Dayton, Ohio, and five years with the Fisher Body Co. at Detroit, where his time was devoted to automotive rubber parts.

Witco Lead Stearate No. 50

A new high lead content primary heat stabilizer and internal lubricant for polyvinyl chloride resins and copolymers has been announced by the Witco Chemical Co., New York 17, N. Y. Called Witco Lead Stearate No. 50, the new stabilizer will fulfill the total heat protective requirements of most vinyl compounds in which lead salts are suitable. With a specific gravity of 2.17, the product decomposes at temperatures above 300° C. without melting. Witco Lead Stearate No. 50, as manufactured, contains less than 1% free fatty acid and has a metal content of 50%. It is available in 99.5% min. through 200 mesh fineness.

Booklets on Western Germany

The Special Mission to Germany of the Economic Cooperation Administration has compiled two booklets of special interest to companies desiring to trade with Western Germany. One is a "Guide and Directory for Trading with Germany" and the other is a list of "Importers of U.S. Commodities for Industrial Uses." Both booklets are available from the Office of Small Business, Economic Cooperation Administration, Washington 25, D.C.

Tire Chain Test Results

The new winterized automobile tires are better than conventional tires on ice but not as effective as tire chains, the National Safety Council reported recently. It added that this was shown in tests early this year conducted by the council committee on winter driving hazards. Officials of the Council said that improvement over conventional tires was not great enough to warrant less care or the elimination of tire chains when driving under severe snow and ice conditions. The best performing winterized tire stopped on glare ice from a speed of 20 miles per hour in an average of 141 feet, the tests showed. Conventional tires required an average of 209 feet. Conventional tires with chains stopped in 79 feet. On dry concrete, conventional tires stopped in 21 feet. Council officials added, however, that tests on ice, snow and mud showed that specialized tires were a definite improvement over conventional tires for specific conditions.

Four-For-One Stock Split Voted

Directors of the Minnesota Mining & Manufacturing Co. have instructed the company's officers to take the necessary steps to split the common stock four-for-one. W. L. McKnight, chairman of the board, said that "in the board's opinion, the action will encourage broader participation in the ownership of the company by making the common stock more marketable—bringing the price down to a level which the small investor would find within his means." He said it is hoped the necessary legal steps can be taken to complete the stock split before December 31. Minnesota Mining had 1,979,337 common shares outstanding on October 31. The stock split would increase this number to 7,917,348 shares. The directors declared a dividend of $1 a share on the common stock and a quarterly dividend of $1 a share on the $4 preferred, both payable on December 12 to stockholders of record on November 22.

Named General Sales Manager

Appointment of George W. Blackwood as general sales manager of the Dewey & Almy Chemical Co., Cambridge, Mass., was recently announced. Prior to his appointment to the newly-created post, Mr. Blackwood was general manager of the company's Rubber Specialties Division. Mr. Blackwood joined Dewey & Almy in 1937, as a sales engineer in the Container Division. He became assistant sales manager in 1945. In 1948, he was appointed assistant to the vice-president in charge of sales, and became manager of the Rubber Specialties Division in 1949. A graduate of Harvard University in 1937, Mr. Blackwood is a member of the Harvard Club of New York, the Varsity Club and the Winchester Country Club.

Spring Joins R. T. Vanderbilt

Ernest S. Spring

Ernest S. Spring has recently joined the R. T. Vanderbilt Co. where he will be associated with the sales staff and will make his headquarters at Detroit, Mich. Mr. Spring is a graduate of Denison University where he studied chemistry. He was with the Pharis Tire & Rubber Co. for twelve years and spent one year each with Polson Rubber Co., Witco Chemical Co., and Lord Manufacturing Co., prior to joining the Vanderbilt organization. Mr. Spring's sales activities in the Detroit territory will include Michigan, Indiana and part of Ohio, which is the territory formerly serviced by J. R. "Bob" Shroyer, who has been transferred to the Vanderbilt laboratories at East Norwalk, Conn.

Col. Sealy Clarke Retires

Lt. Col. James Sealy Clarke, who has enjoyed a long and distinguished career in the rubber manufacturing field in England, has retired from his executive position with George Spencer, Moulton & Co., Ltd. In 1919, together with Alexander Johnston, Col. Sealy Clarke founded the Research Association of British Rubber Manufacturers, serving as chairman of that organization from 1926 to 1933 and as president in 1933-34. He was a member of the committee of the India Rubber Manufacturers' Association and later participated in the formation of the Federation of British Rubber Manufacturers' Associations which succeeded the I.R.M.A. Col. Sealy Clarke has also resigned from the council of the R.A.B.R.M. and as vice-president of the I.R.I.

Pickles 6th Foundation Lecturer

The Institution of the Rubber Industry, of England, has announced that Dr. Samuel S. Pickles has been selected as the Foundation Lecturer for 1951. He will deliver the lecture in Manchester before the Manchester Section some time next year. Dr. Pickles retired recently after 38 years as chief chemist of George Spencer, Moulton & Co., Ltd.

LOS ANGELES NEWS

The November 8th meeting of the Los Angeles Rubber Group held at the Hotel Mayfair in Los Angeles, Calif., was addressed by Eugene Biscailuz, Sheriff of Los Angeles County. Sheriff Biscailuz spoke on "Yesterday, Today and Tomorrow in Law Enforcement." The technical session of the meeting was addressed by Vic Vodra, sales manager of calcium carbonates for the Wyandotte Chemical Co., Wyandotte, Mich. Mr. Vodra's address on "Calcium Carbonates and Their Advantages in Rubber and Plastics" was similar to the one he delivered before the Northern California Rubber Group on October 26. A full report on this paper appeared in the November issue of RUBBER AGE.

Following the technical session, J. W. Raynolds, assistant manager in charge of silicone products for the Chemical Division of the General Electric Co., Waterford, N. Y., spoke on "New Developments in Silicone Rubber Polymers and Compounds." Mr. Raynolds, in his talk, stated that General Electric has pioneered in the development of silicone rubbers, and that during the past year G-E research and development engineers have been making steady progress in perfecting new silicone rubber polymers and compounds.

Similarity to Natural

These new materials look, feel, and handle more like the natural rubber products. The new G-E 81223 silicone rubber compound has nearly twice the elongation and tensile strength of older products, and also has the excellent high and low temperature characteristics for which silicone rubbers are especially noted. It handles easily in a cool rubber mill and can be calendered, extruded, or molded by compression, transfer, or injection processes, with curing cycles as short as one minute at 300°F. Time and temperature may be varied to obtain a wide variety of ultimate properties, Mr. Raynolds stated.

In addition to 81223 compound, G-E is also introducing a new silicone rubber polymer 81275. This polymer, when properly compounded, will yield an excellent rubber paste for spreading on glass cloth and other surfaces, the speaker said.

A new G-E primer developed to obtain excellent adhesion of new G-E silicone rubber to metals and glass is being released to rubber fabricators. Designated as G-E 81267, a unique feature of this primer is its ability to develop a bond strength greater than the strength of the silicone rubber in most cases, at any stage of the cure. Tests confirm a bond strength of 700 lbs. per sq. inch and higher, Mr. Raynolds concluded.

On November 8, H. R. Thies, manager of the Chemical Division of the Goodyear Tire & Rubber Co., addressed the Los Angeles Paint, Varnish and Production Club. Mr. Thies assured the group that Chemigum latex paints will claim a permanent position in the interior decorating field. In addition, he said, man-made rubber latices hold promise for exterior coatings as well.

"Although present rubber restrictions make its immediate and general use uncertain," Mr. Thies asserted, "tests and evaluations will be considered for future consideration." From tests already conducted and those in progress in Goodyear laboratories at Akron, latex paints will be of extreme interest both to the consumer and to the manufacturer.

He explained that this new type of paint, which has most of the advantages of oil paints, also has the desirable characteristics of water emulsions, that of using water in place of the usual organic solvents. Use of water, he added, thus eliminates the sometimes toxic odor of paint which has long been an objectionable problem of the industry. Quick drying characteristics of latex paint, and its superior scrub resistance too, should have strong appeal to the consumer.

The manufacturer in turn, he said, will be aided through reduced storage and inventory problems, as well as fire and toxicity hazards, by elimination of solvents, mostly of an unstable nature. Mr. Thies also discussed briefly the use of Pliolite resins and latices (butadiene-styrene) in paint formulations.

Reports have been received on the formation of the Advance Latex Products Co., 8467 Stellar Drive, Culver City, Calif. The company manufactures latex foam products.

Rubber Products, Inc., formerly of 2023 Bay St., Los Angeles 21, has moved into a new plant at 1702 West 134th St., Gardena, Calif.

Molded Products, previously located at 111 North La Cienga, Los Angeles 36, has moved into new quarters at 1884 Sepulveda Blvd., Los Angeles.

Walt Westman, formerly associated with Sierra Rubber Products and Engineering Co., Inglewood, Calif., has joined the National Sponge Cushion Co., Huntington Park, Calif.

Crown Rubber Co. of Pasadena, Calif., have purchased the building of which they formerly rented a portion, and are planning an immediate expansion to occupy the entire structure.

F. T. Shor, formerly associated with the American Wringer Co. of Woonsocket, R. I., has joined the MacClatchie Manufacturing Co., Compton, Calif., as chief chemist.

Caram Manufacturing Co., Los Angeles 1, Calif., has acquired 1½ acres and a new building with 12,500 square feet of floor space at 525 East Evergreen St., Monrovia, Calif. Company officials state that operations are scheduled to begin on January 2, 1951, at the new location.

Over 50 students have enrolled in the new course in "Basic Rubber Technology" sponsored by the Los Angeles Rubber Group at City College in Los Angeles. Negotiations are under way with the college for both a two-year and four-year course in rubber subjects.

Three-Component Rubber Tree

Some data on the so-called three-component rubber tree was recently given by Dr. Ernest P. Imle, principal agriculturist in Costa Rica of the Division of Rubber Plant Investigations of the U.S. Department of Agriculture, in a talk before the Plant Protection Congress in Mexico City. According to Dr. Imle, the three-component tree, a development that represents a radical change from standard propagating practice in the highly-developed, blight free Hevea plantations of the Far East, is built up by base budding of seedlings with high-yielding strains, and later top budding at a height of 6 feet with leaf blight-resistant material to form a resistant crown. The big-yielding selections are first budgrafted low on seedlings known for a highly efficient root system. This budgraft becomes the main body of the new tree designed for the commercial plantation or farm grove, but it must be sprayed to be kept free from blight, as the present "big milkers" are not resistant. Since Hevea trees grow far above ordinary profitable spray range (more than 60 feet high), spraying couldn't go on after they attained anywhere near that size. The scientists, therefore, have found it feasible to make over the top of the 8-foot tree by budgrafting on it an entire new cover of resistant leaves. The system might be called "blight proofing."

Named Harmon Board Chairman

W. S. Richardson, president of the B. F. Goodrich Chemical Co., has been elected chairman of the board of Harmon Color Works, Inc., the recently acquired subsidiary of the B. F. Goodrich Co. Other members of the new board are Victor J. Chartrand, president of Harmon; Vincent C. Vesce, vice-president of Harmon; John L. Collyer, president of B. F. Goodrich; F. K. Schoenfeld and J. R. Hoover, vice-presidents of B. F. Goodrich Chemical and R. G. Jeter, general counsel for Goodrich. Other Harmon officers are Harold T. Madden, vice-president, and Mr. Jeter, who is secretary.

Brochure on Carbon Black

An informative brochure on "Carbon Blacks for the Rubber Industry" was recently made available by the Witco Chemical Co., 295 Madison Ave., New York 17, N.Y. The brochure lists all of the channel and furnace blacks available by type, such as conducting channel, medium processing channels, medium abrasion furnace, fine furnace, medium thermal, etc. The Witco and Continental blacks are indicated in red, with all of the other types in black print.

Midwest Rubber Promotes Totsch

Carl Totsch

Carl Totsch, associated with the Midwest Rubber Reclaiming Co., East St. Louis, Ill., since 1945, has been named assistant sales manager of the company. Mr. Totsch attended the School of Commerce and Finance of the University of St. Louis from which he was graduated in 1939. After a brief period with the Government postal service, Mr. Totsch entered the Armed Services in March, 1942. Immediately following his release from military service in 1945, he joined the East St. Louis plant of Midwest Rubber Reclaiming where he worked in the Purchasing Department. In March, 1946, he was transferred to the Barberton, Ohio, plant with the title of purchasing agent and traffic manager. In 1948, Mr. Totsch was transferred to the sales organization at the Barberton plant, where he remained until his recent appointment.

Fire Destroys New Milford Plant

The plant and offices of the New Milford Rubber Co. at New Milford, N. J. were completely destroyed by fire which raged for more than four hours on December 6. The fire, which broke out during the early morning hours, was fanned by cold, north winds which swept the flames through the 30-year old frame structure. R. H. Jacobs, of New York, owner of the company, estimated total damage at approximately $250,000, including machinery, equipment, stock and the building itself. The damage was covered by insurance.

Bearfoot Sole Still Expanding

Although the 1949-50 expansion program of the Bearfoot Sole Co., Wadsworth, Ohio, has been completed, according to a recent statement of the company, a new program for 1950-51 has already been launched. The latter calls for a $200,000 expansion in equipment, some of which is to be delivered in March, and expansions to buildings amounting to approximately $125,000. The company recently paid its 10th consecutive dividend.

Cornish Wire Co., Inc., has moved its executive offices to 50 Church St., New York, N. Y.

Hewitt Seven-Mile Belt Conveyor

A seven-mile belt conveyor, said to be the longest in operation at the present time, is presently in operation on the Bull Shoals Dam project on the White River in northern Arkansas. Manufactured by Hewitt-Robins, Inc., the belt conveyor was started about two years ago to move a 4,000,000-ton mountain across two valleys to construct the man-made mountain that is the dam. The conveyor belt, traveling 525 feet a minute, crosses two valleys, five roads and innumerable streams as it comes rolling down the mountain. Seven of the 21 "flights" of the conveyor belt generate enough power to keep the belt running and turn back the excess to the project electrical supply. The belt rides on 14,000 V-shaped "idlers" which are of the one-shot lubrication type. Capable of carrying 650 tons of crushed rock in an hour, the belt is maintained by only seven men. It is expected that the moving job will be completed by the end of 1950.

Moving Naval Stores Unit

Arrangements are under way for moving the Southern Regional Research Laboratory of the U. S. Department of Agriculture from New Orleans, La., to Olustee, Fla. The transfer, affecting 15 persons, is expected to be completed by the end of the year. The transfer is being made in order to house the Bureau's entire Naval Stores Research Division in one location closer to the center of the pine belt. The Division's pilot plant for the development of improved experimental processing of pine gum into turpentine and rosin has been in Olustee since 1931. Personnel of the Division's Technological and Fundamental Sections are involved in the move.

Kaplan Buys "Krene" Equipment

The purchase of all manufacturing equipment for the production of "Krene" plastic products, and all inventory from the National Carbon Co., a division of Union Carbide & Carbon Corp., has been announced by Joseph A. Kaplan & Sons, New York, N. Y. Sole producer of Koroseal shower curtains for the past 12 years, the Kaplan firm will handle the Krene inventory until supplies last, and thereafter will manufacture all patterns and colors with materials made of Koroseal, a product of the B. F. Goodrich Chemical Co. The new equipment will be absorbed into the Kaplan operation where an expansion is currently under way. The Krene trademark will continue to be the property of Union Carbide & Carbon.

Raises Mineral Rubber Output

Witco Chemical Co., New York 17, N. Y., has increased its production of Hydrocarbon (MR) to take care of the rising demand due to larger consumption of synthetic rubber. The product also finds use in extending natural rubber. The company states that it is in a position to make fairly prompt shipments on granular, lump or solid Hydrocarbon (MR) in full truckloads or carloads.

Luskin Joins Chemical Division

Robert G. Luskin

Robert G. Luskin, formerly a cement and adhesives compounder for the Goodyear Tire & Rubber Co. at the Los Angeles, Calif., plant, has been transferred to the sales staff of the company's Chemical Division. For the time being, Mr. Luskin will be stationed in Los Angeles. A graduate of the University of Pittsburgh, Mr. Luskin has been affiliated with Goodyear since 1946. During the war he served as a captain of anti-aircraft batteries in the Philippines and New Guinea.

Sloane-Blabon Completes Expansion

Sloane-Blabon, Inc., has doubled its capacity for producing hard surface floor coverings with completion of its $11,000,000, three-year plant expansion program. The program included 21 new buildings at the company's Trenton, N.J., plant, and 7 new buildings at its Philadelphia, Penna., plant. Production of printed felt base floor coverings and marbleized linoleum at the Trenton plant has been doubled. Production of Koroseal, asphalt and rubber floor tile has also been proportionately increased.

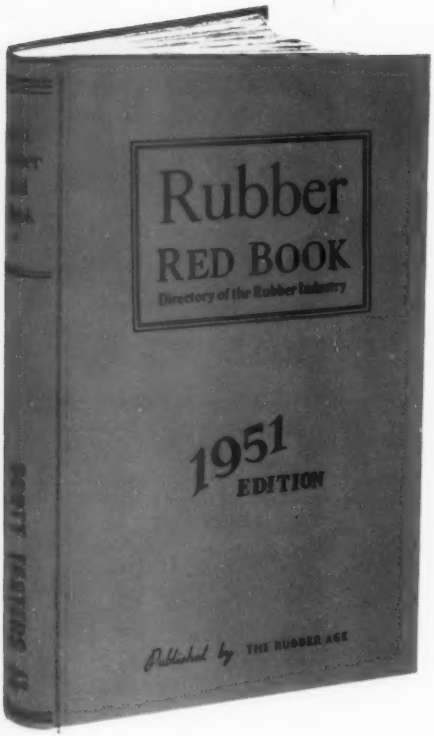
Offer Technical Data Sheets

New technical data sheets on Calcene T, Silene EF, and Hi-Sil have been made available by the Columbia Chemical Division of the Pittsburgh Plate Glass Co., Pittsburgh 13, Penna. Typical properties of the respective materials are outlined and suggested applications listed. Copies of the new data sheets are available from the company on request.

Detroit to Hear Gresham

Dr. Thomas Gresham, manager of plastics development of the B. F. Goodrich Co., will be the principal speaker at the meeting of the Detroit Rubber & Plastics Group, Inc., to be held on February 16. As usual, the meeting will be held at the Detroit-Leland Hotel. Dr. Gresham will speak on "Polyacrylic Rubber."

Plan now for Advertising



The Eighth issue of the RUBBER RED BOOK—the 1951 edition—is scheduled for publication in April, 1951.

As usual, the forthcoming edition will have various improvements and up-to-the-minute corrections and additions to keep pace with the growth and progress of the rubber industry. This constant improvement in each succeeding edition is the key to the continued acceptance and wide use of the RUBBER RED BOOK by the important men in the rubber field . . . and that's why it is such an outstanding advertising medium for suppliers to the industry.

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CANADIAN NEWS

Since the oil fields of the Western Provinces can now supply the basic raw material, Canada has become self-sufficient in the production of synthetic rubber, J. R. Nicholson, executive vice-president of the Polymer Corp., Sarnia, Ontario, Canada, recently told the Montreal Branch of the Engineering Institute of Canada.

The movement of tremendous quantities of oil to Sarnia, where it will be refined, will make available vital new materials to the growing petro-chemical industry of Canada, he said. Mr. Nicholson related the story of the $58,000,000 Crown-owned plant established at Sarnia in 1942 to take care of Canada's wartime requirements of synthetic rubber.

Since the end of the war, Polymer has branched out in the petro-chemical and plasti-chemical fields. An additional $7,500,000 will be spent within the next year on facilities which will make Canada independent of the rest of the world for its needs of certain chemicals and plastics.

Mr. Nicholson paid tribute to the co-operation of the established Canadian companies in the field of rubber, petroleum and plastics which helped in the technical and personal development of Polymer. These companies have now become customers of the Crown-owned corporation for basic materials, he said.

An order restraining Combines Commissioner Thomas D. MacDonald from making a report to the Federal Government on the results of a three-year investigation into an alleged rubber combine will soon be sought in weekly court at Osgoode Hall, Toronto. The injunction is sought by the rubber companies on the grounds that Mr. MacDonald is not the Commissioner named in Section 27 of the Canadian Combines Investigation Act and so has no power to make a report in writing to the government.

The investigation was authorized by Commissioner Fred A. McGregor and started in September, 1947. Ian M. MacKeigan was appointed deputy commissioner and was authorized to carry on the probe in September, 1948. Both handed in their resignations, the statement of claim by the rubber companies says, and both resignations were accepted by order-in-council. The McGregor resignation became effective on January 1, 1950, and the MacKeigan resignation on Dec. 10, 1949. Solicitors for Commissioner MacDonald are asking that the motion be dismissed since the plaintiffs "have established no right in law to the relief claimed."

Plaintiffs seeking the injunction included the Rubber Association of Canada, Acton Rubber, Limited, Barringham Rubber and Plastics, Ltd., Cambridge Rubber, Limited, Canadian Allis-Chalmers, Ltd., Canadian General-Tower, Ltd., Dominion Rubber Co., Ltd., Dunlop Tire and Rubber Goods Co., Firestone Tire and Rubber Co. of Canada, Ltd., General Tire and Rubber Co. of Canada, Ltd., B. F. Goodrich Rubber Co. of Canada, Ltd., Goodyear Tire and Rubber Co. of Canada, Ltd., G. L. Griffith and Sons, Ltd., Gutta Percha and Rubber, Ltd., Holtite Rubber Co. of Canada, Ltd., Kaufman Rubber Co., Ltd., Kaufman Rubber (Ontario), Ltd., Miner Rubber Co., Ltd., Northern-Woodstock Rubber, Ltd., Panther Rubber Co., Ltd., Seiberling Rubber Co. of Canada, Ltd., and Viceroy Manufacturing Co., Ltd.

Directors of the Dunlop Rubber Co. in England secured authority to issue the whole of the 21,650,930 unissued shares of the company and to increase borrowings to 20,000,000 pounds sterling at a special general meeting of stockholders in London recently.

The resolutions permit the directors to determine the price and terms of sale of stock and to make the 20,000,000 pound borrowing power subject to the condition that all borrowings by the company and its subsidiaries, except internal borrowings, shall not exceed the aggregate of paid-up capital reserves and surplus of the company and subsidiaries.

Clive Baillieu, chairman of the board, explained that additional funds are required to permit continued expansion and development of the company's subsidiaries' fixed assets. He says that this work has for years been done from the group's own resources, but that due to rising prices of raw materials and the resultant need for large working capital, that policy cannot be adhered to at this time.

The company has made no issue of capital to stockholders or the public since 1928 except for a 6,000,000 pound debenture issue in 1946, of which half was for refunding. The Dunlop Tire and Rubber Goods Co., Ltd., in Canada is controlled by the Dunlop Rubber Co.

The 3rd Canadian High Polymer Forum is to be held in May, 1951, at the Royal Military College in Kingston, Ont., according to an announcement made by Dr. Harry Sheffer, program director of the Forum. Sponsored by the Chemical Institute of Canada, this Forum also has the support of the National Research Council of Canada.

Forum officials are planning to include in their program a series of short papers to cover as wide a range of subjects as possible. Any subject will be considered that deals with the science of large molecules, including pulp and paper, rubber, natural polymers, plastics, textiles, protective coatings, and other fields.

One of the guest speakers at the Forum will be Dr. H. M. Spurlin of Hercules Powder Company, Wilmington, Del., who is an internationally known authority on the solubility of high polymers. Prospective authors of papers are requested to submit tentative titles before January 1, 1951, to Dr. Sheffer at Defence Research Chemical Laboratories, Ottawa, Ont.

Dybvig Rejoins Firestone Tire

Charles C. Dybvig

Charles C. Dybvig has rejoined the Development Department of the Firestone Tire & Rubber Co. after a two-year leave of absence. He will return to his former duties in Detroit, Mich., as resident engineer of the Tire Division, working with the car and truck manufacturers in that area. Born in Michigan, Mr. Dybvig attended the University of Michigan and was graduated with a B. S. in Engineering in 1931. Joining Firestone in 1933, he held several sales positions with the company in the Philadelphia, Penna., area. Immediately after Pearl Harbor, he joined the Development Department. There he spent the early months of World War II in the intensive synthetic rubber development program. This later led to his assignment in Detroit as resident engineer, which position he held from 1944 to 1948.

Harwick Offers Technical Bulletins

With various shortages developing in raw materials for rubber compounding, the Harwick Standard Chemical Co. has prepared a number of technical bulletins covering the use of extenders, substitutes, etc., for some of the more critical materials. One of the new bulletins covers the use of Resinex, a dark hydrocarbon resinous polymer, which proved itself of considerable value in extending carbon blacks during previous shortages. Another is devoted to the reduction of titanium dioxide and lithopone by means of Stan-Clay and Stellar-R Clay. The latter bulletin gives test results on GR-S-50 stock using 130 parts loading. Copies of the new bulletins are available from the company on request.

Data on Educational Possibilities

An interesting brochure on educational possibilities concerning rubber in Europe and the Far East has been prepared by the Rubber-Stichting, Delft, Holland. Issued as Communication No. 135, the brochure covers four classifications: Agriculture and Production of Rubber; Industrial; Trade, and General. The university, institute or organization offering subjects in each classification are tabulated in the brochure.

DuPont Announces Promotions

The promotions of H. Logan Lawrence, William H. Ayscue, and Samuel W. McCune, III, to the newly created positions of sales supervisors in the Boston, Chicago, and New York district offices of the Du Pont Company's Rubber Chemicals Division have been announced. In other reassignments of Rubber Chemicals personnel, E. Paul Hartsfield was transferred to the Akron office as a salesman and R. Scotton Griffin to the Boston office in the same capacity.

Mr. Lawrence has been with DuPont since 1934, when he was graduated in chemical engineering from the University of Missouri. After two years as an industrial engineer he transferred to the Rubber Chemicals Division, where he has served as a neoprene applications engineer and a compounder in the Rubber Laboratory. For three years prior to his transfer to the Boston office he held the position of export sales manager for rubber chemicals and neoprene.

Mr. Ayscue joined DuPont in 1935 after receiving his master of science degree in chemical engineering from North Carolina State College. During his 15 years with the company, he played an important role in the early development of neoprene applications and, in later years, was engaged in sales work in the Wilmington and Akron offices.

Mr. McCune was graduated from Princeton University as a chemical engineer in 1938 and spent a year at Mellon Institute before joining DuPont as a compounder in the Rubber Laboratory. During the past five years he has been assigned to the main office as a neoprene applications engineer and has been active on committees of the American Society for Testing Materials, the Society of Automotive Engineers, and the American Petroleum Institute.

Mr. Hartsfield has been with DuPont since 1940, when he received his master's degree in chemistry from Emory University. He has served as a technical production supervisor in the manufacture of rubber chemicals and, more recently, as a compounder in the Rubber Laboratory at Deepwater Point, N. J., and in the Akron Laboratory.

Mr. Griffin has been associated with the Rubber Chemicals Division since his graduation in electrical engineering from Cornell University in 1946. He was a compounder in the Rubber Laboratory and recently served as a special assistant to O. M. Hayden, Rubber Chemicals technical sales manager.

Changes at Kaiser Aluminum

T. J. Ready, Jr., who has been director of manufacturing of the Kaiser Aluminum & Chemical Corporation for several years, has been elected a vice-president of the company. He has been succeeded as director of manufacturing by Stanley White, previously associated with the Reynolds Metal Co. at Louisville, Kentucky. Dr. A. Greenfield, formerly associated with the Anaconda Wire & Cable Co. at Hastings-on-Hudson, N. Y., has joined the Wire and Cable Department of Kaiser Aluminum at the Newark, Ohio, plant.

LABOR NOTES

Sun Rubber Co., Barberton, Ohio, granted a 9-cent-an-hour general wage increase to its 1100 production employees on November 13. The company also granted additional increases to some workers where wage inequities existed, giving some workers an increase of as much as 18 cents an hour.

The URWA won the first round in its attempt to organize the workers of the Dismuke Tire & Rubber Co. at Clarkdale, Miss., when the National Labor Relations Board ruled that the company had committed unfair labor practices in its dealings with the union local. The union's request for a bargaining conference was turned down by management and the union requested a NLRB hearing. The trial examiner ordered the company to recognize the union at once.

The executive board of Firestone Local 7 of the URWA has accused the company of holding up pension payments to retired workers. Under terms of the company-union agreement, the pension plan was to have been put into effect last May, but by November it still was not functioning. A company spokesman attributed the delay to the necessity for securing approval from the Bureau of Internal Revenue, among other reasons.

A 12-cent-an-hour increase, 10 cents across the board and 2 cents for wage inequities, has been granted by the Mohawk Rubber Co. to its 650 production workers. Only wages were discussed in the recent negotiations, the company-union contract having an expiration date of April 7, 1951. Wages may be reopened for discussion at the end of the contract.

Oak Rubber Co., Ravena, Ohio, signed a new contract with its URWA local on November 14 calling for a 7-cent-an-hour general wage increase. The contract is effective until July 12, 1952, and provides for reopening of wage talks by either party after July 15, 1951.

The URWA won a bargaining election last month held for employees of the Rubber Corporation of California, Garden Grove, Calif. The National Labor Relations Board, which handled the voting, said 212 production, maintenance and shipping room employees voted for the union, and only six votes were cast against it.

Workers at the Lincoln, Neb., plant of the Goodyear Tire & Rubber Co. voted to return to work on November 25 after walking off the job a few days earlier after 77 V-belt workers were suspended for participating in a wildcat strike. The V-belt workers claimed the company failed to provide adequate ventilation in the curing room.

Emery Industries, Inc., Cincinnati 2, Ohio, has announced the availability of a descriptive bulletin covering two new Emery products, 12-hydroxystearic acid and hydrogenated castor oil.

Wintsch Promoted At Naugatuck

Dr. Harry Wintsch, formerly production superintendent of the Naugatuck, Conn., plant of the Naugatuck Chemical Division of the U. S. Rubber Co., has been appointed assistant to the production manager of the division. Dr. Wintsch is a veteran of 23 years experience with U. S. Rubber. He joined Naugatuck Chemical in 1927 as a research assistant after receiving his Ph. D. degree in chemistry from the University of Switzerland in Zurich. He worked his way up through various technical and supervisory positions and in 1941 became assistant manager for Naugatuck Chemical, Ltd., at Ontario, Canada. In 1948, he rejoined the division's plant at Naugatuck as technical superintendent and in October, 1948, became superintendent of chemical production. At the same time it was announced that Frederick N. Taff, associated with the division since 1935, has been appointed plant engineer for the Naugatuck plant. Mr. Taff was first associated with the company as a technical assistant in the Naugatuck plant. In 1937, he became a foreman in the Dispersions Department and in 1942 was made a maintenance supervisor in the synthetic rubber plant at Naugatuck. He transferred back to the chemical plant in 1948 as a mechanical engineer in charge of maintenance, the position he held until his recent promotion.

G-E 81223 Silicone Compound

A new silicone rubber compound said to permit rubber fabricators to mold silicone rubber parts easier and with highly improved mechanical and thermal properties has been developed by the Chemical Department of the General Electric Co., Pittsfield, Mass. Designated as 81223 Compound, the new product is reported to be outstanding for its ease in processing. Many parts can be fabricated from it without prolonging oven cure, and it has excellent molding and extrusion properties after only a five-minute warm-up, the company states. Fabricated parts obtained with the new rubber compound have high tensile strength, high elongation, excellent electrical properties and are serviceable over a wide temperature range. Many new applications for silicone rubber mechanical goods, including diaphragms, boots, sleeves, belting, hose and mountings, are expected to evolve through the use of the new compound.

Electric Hose Has Anniversary

The Electric Hose & Rubber Co., Wilmington, Delaware, is currently celebrating its fiftieth anniversary. Founded in 1900 as the Chicago Electric Hose Co., following the reorganization of the defunct Chicago Electric Wire Co., the company has expanded steadily through the years. The current name was adopted in 1905. At present, Electric Hose employs approximately 1,000, and its plant occupies 262,000 square feet of floor space with a capacity of 15,000,000 feet of hose per year. C. D. Garretson, who has been with the company since 1903, has been serving as president since 1923.

OBITUARIES

Maxwell P. Boggs

Maxwell P. Boggs, treasurer of the University of Akron and secretary of its board of directors, died at his home in Akron on November 16. Mr. Boggs was 52 years old. Born in Pittsburgh, Penna., Mr. Boggs moved to Valencia, Penna., when he was six years old, attending grade and high schools there. He quit high school to get a job because of financial reverses and became a runner for a Pittsburgh brokerage house. During World War I he served with the United States Army, and upon his return from service worked in a Pittsburgh bank. Mr. Boggs entered Muskingum College shortly thereafter, and in 1924 was graduated with a degree in business administration. For a while after graduating he worked for the National Cash Register Co. Then he returned to Muskingum College as secretary to the president. In April, 1927, Mr. Boggs became assistant secretary of Akron University. In 1932, he became treasurer of the university and secretary of its board of directors. Mr. Boggs was a member of Omicron Delta Kappa, and had served as vice-president of the Ohio Association of University and College Business Officers. He also was secretary of the Akron Purchasing Agents Association. Services were held at the Adams Funeral Home in Akron. He leaves his wife and daughter.

Lyle A. Clough

Lyle A. Clough, most recently associated with the Moldex Rubber & Plastics Corp., New York 22, N. Y., as chief chemist, died of carbon monoxide poisoning on October 25. Mr. Clough, who was 55 years old, had been working on his automobile in the garage of his home in Logansport, Ind., when he was felled by the noxious fumes. He had been active in the rubber industry for many years, and had previously been associated with Barney Bristow, Inc., Virginia Rubatex Division of Great American Industries, Lord Manufacturing Co., the Toyad Co., the Goodyear Tire & Rubber Co., Cheney Chemical Co., Philadelphia Rubber Works Co., and other firms in technical capacities. Mr. Clough served as a Lt. Colonel during World War II, and had been cited for leadership in liaison between the armed forces and industry. Full military services were held on October 30 at Arlington National Cemetery at Fort Meyers, Va., where the body was interred. He is survived by his wife and four sons, one of whom is presently serving with the armed forces in Korea.

Vinylite plastic cast film, product of the Bakelite Division of Union Carbide & Carbon Corp., is now being used as a protective cover on merchandising samples of the Star Brush Co., Boston, Mass.

James E. Hale

James E. Hale, consulting engineer for the Firestone Tire & Rubber Co., died at his home in Akron, Ohio, on November 28. He was 66 years old. Born in Manchester, N.H., Mr. Hale was graduated from the Massachusetts Institute of Technology in 1908. He came to Akron in 1911 to work for the Goodyear Tire & Rubber Co. In 1921, Mr. Hale joined Firestone and organized the Tire Development Engineering Department. He is credited with the development of the modern balloon tire and with basic engineering designs on farm tractor and earth-mover tires. At the time of his death, Mr. Hale had 30 tire and rim patents to his credit. He was president-elect of the Society of Automotive Engineers at the time of his death and was to assume office in January, 1951. He also was a member of the Automotive Oldtimers' Club and the American Ordnance Association. Mr. Hale was formerly president of the Tire and Rim Association. His wife and son survive.

Louis A. Mayle

Louis A. Mayle, retired founder of the Fremont Tool & Die Co., Fremont, Ohio, died at his home in Fremont on November 17 at the age of 74. Born in Fremont on November 5, 1876, Mr. Mayle attended the public schools of that city leaving in the 8th grade to become an apprentice machinist with the former June Co. Later, he worked in Cleveland and Sandusky, Ohio, and was an experimental man with the Toledo Machine & Tool Co. He started a small machine shop in Toledo, Ohio, in 1907, but returned to Fremont and in 1910 founded the Fremont Tool & Die Co. During World Wars I and II, the company produced many dies beneficial to the war effort, receiving the Army and Navy "E" award. Mr. Mayle retired from active business life four years ago turning over operations to his four sons. His wife, four sons and three daughters survive.

John E. Resseger, Sr.

John E. Resseger, Sr., retired head of Resseger & Morgan Products, Inc., toy manufacturers of Canal Fulton, Ohio, died in City Hospital in Akron on November 12. He was 61 years old. Since his retirement from the toy manufacturing field two years ago, Mr. Resseger had been employed with the Herberich-Hall-Harter Co., Akron, real estate and insurance firm. A native of Belmont County, Ohio, Mr. Resseger had lived in Akron for nearly 40 years. A 32nd degree Mason, he was a past master of Loyalty Lodge 645 of the F. & A.M. Services were held on November 15 at the Long Funeral Home in Akron. He leaves his wife, two sons and a daughter.

Shell Opens New Laboratory

Shell Development Co. dedicated a new consolidated laboratory for oil research at Emeryville, Calif., on November 22. It is described as the largest research institution on the West Coast and one of the largest petroleum laboratories in the world. Several new products were demonstrated, including a new plastic known as epon resin. It is a bullet-proof material the basis of which is a resin made from epichlohydrin and bis-phenol, one a liquid, the other a solid. Combined, they are said to form one of the most potent adhesives ever known. When cloth woven from glass fibers is added, the product becomes a kind of plastic and glass sandwich about as light as aluminum and as bullet-proof as steel. Other new products demonstrated at the ceremony included synthetic rubbers, special waxes and lubricants, antifoaming compounds and rust preventives. Consolidation and expansion of the Shell Laboratories in the Emeryville area and the addition of several new plants and an office building centers all of Shell Development's activities in one location. The research center employs more than 1,100 persons, including scientists from 135 American and 13 foreign universities and colleges. Its research techniques range from atomic energy to glass blowing.

Request Production of Buna

According to reports from Germany, the West German Ministry of Economic Affairs has made formal application to the Allied High Commission for the resumption of the production of buna rubber in the Western Zone. There are two buna plants in the Western Zone, one located near Recklinghausen in the Ruhr district and the other at Ludwigshafen. The Ludwigshafen plant has been almost completely dismantled and experts believe it would take years to refit it for operation. The Recklinghausen plant is in much better shape and it is reported that an investment of approximately $238,000 would permit production of between 6,000 and 7,000 tons a year. Maximum production of synthetic rubber in Germany before the war approached a peak of 120,000 tons a year. The formal application pointed out that the buna plant at Schkopau in the Eastern Zone has been in continuous operation for the past few years.

Plan Plant Maintenance Show

The most elaborate and intensive meetings ever undertaken on the subject of plant maintenance will be held in Cleveland, Ohio, from January 15 through 18, when the Plant Maintenance Show and the concurrent Conference on Plant Maintenance will be held at the Public Auditorium. Forty-five speakers drawn from a cross-section of American industry will address the conference while more than 150 companies will display thousands of new products designed to cut the huge maintenance costs of industry. The conference is sponsored jointly by the American Society of Mechanical Engineers and the Society for the Advancement of Management.

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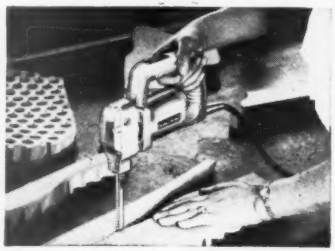
. . . cuts up to 4″ thick at speeds up to 30 ft. a minute!



A brand new electric tool designed by Stanley that puts cutting of sponge and foam type rubber on a production basis. Saves time and material.

Follows any line or templet, inside or outside—straight cuts, curves and angles—with hairline precision. No concave edges, no torn or ragged work.

Light weight (only 4 lbs.). The duplex handle permits easy handling on all operations. Girl operators like it.

No. 99 Sponge Rubber Cutter operates on either A.C. or D.C. Blades are made of alloy steel for long life and are easily replaceable.

Save material, save time with the new Stanley Sponge Rubber Cutter No. 99. Ask your supply house, or write for folder. Stanley Electric Tools, 562 Myrtle St., New Britain, Conn.

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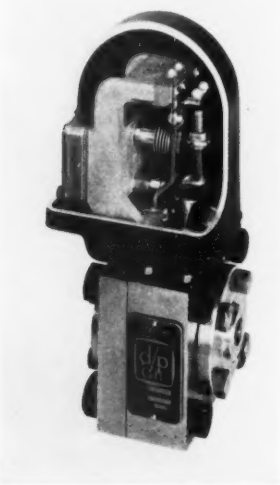
NEW EQUIPMENT

Foxboro d/p Cell

Better flow measurement is said to be possible with the Foxboro d/p Cell (differential pressure pneumatic transmitter), recently developed and introduced by the Foxboro Co., Foxboro, Mass. Seal pot troubles in the measurement of the flow of viscous or corrosive liquids are reported to be completely eliminated when this new unit is utilized. The



unit, illustrated herewith, is a compact, mercuryless measuring mechanism operating on the highly accurate force-balance principle.

According to Foxboro engineers, the specific advantages of the new cell are particularly evident in the production of synthetic rubber. The installation of the cell on the latex line to blend tanks in one of the copolymer plants operated by the Goodyear Synthetic Rubber Corp. in place of a conventional mercury manometer-type meter resulted in virtual elimination of loss of production time due to instrument trouble, reduction of man-hours required for maintenance from 6 to 1 per week, and estimated savings from these benefits sufficient to pay for the complete instrumentation in approximately one year.

The details of the Goodyear experience have been made available by the Foxboro Co. in the form of a report, copies of which are available on request to the company. The report discusses the difficulties normally encountered when seal pots are used in an application of this kind and also describes the routine clean-out procedure which was followed both before and after the d/p Cell Transmitter was installed.

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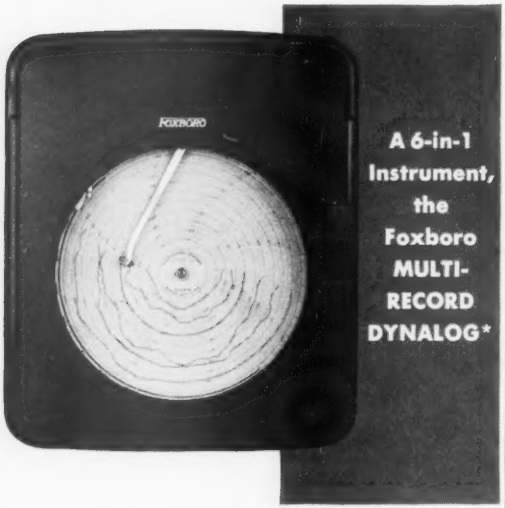
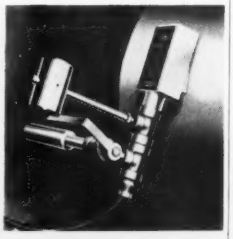


A 6-in-1 Instrument, the Foxboro MULTI-RECORD DYNALOG*

Employing only one pen arm and one measuring circuit, this spectacularly speedy yet simple electronic instrument gives up to 6 different temperature records in 6 different colors on a single round chart! Every 6 seconds, it records a new measurement — so fast that records appear as continuous lines. There's nothing like it! Get all the facts on this money-saving, precision-built instrument. Send for Bulletin 427-1. **The Foxboro Company, 256 Neponset Ave., Foxboro, Mass., U.S.A.**

TYPICAL APPLICATIONS IN RUBBER PROCESSING

Calender and Mill Roll Temperatures (unique Foxboro Roll Surface Measuring Head shown at right); Polymerizers; Banbury Mixers; Condensate and Stock; Steam, etc. Any such measurements all recorded on one chart.

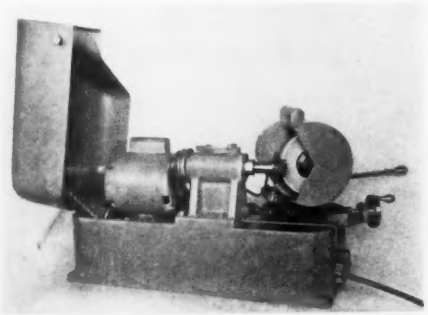


†Exclusive of temperature bulbs.
•Reg. U. S. Pat. Off.

FOXBORO Instrumentation
INDICATING · RECORDING · CONTROLLING

Camachine PG Slitter-Grinder

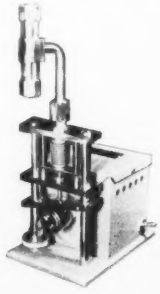
Built to handle either large 4½-inch mill type wheels or the smaller 3-inch wheels, the Camachine PG Slitter-Grinder designed by the Cameron Machine Co., 61 Poplar St., Brooklyn 2, N. Y., fulfills the need for precision grinding and polishing of score-cut slitter wheels. A



calibrated scale controls the adjustment of the pivot mounted grinding assembly assuring perfect centralization of the cutting edge. Three-speed control of the work arbor drive allows for quick change-over, adapting the speed to either size wheel and up to 3600 r.p.m. for polishing. The grinder is approximately 24 by 12 by 15 inches and has a heavy base to absorb any vibration. The motor powering the work arbor is covered with a cast aluminum guard.

Corson-Cerveny Micro-Bellows Pump

Primarily developed for laboratory scale pumping of materials which are liquid at room temperature, the Corson-Cerveny Micro-Bellows Pump developed by the Research Appliance Co., Box 413, West View Road, Pittsburgh 9, Penna., can be adapted to pump low boiling liquids such as pentane and melted solids and viscous



materials. It is a pulsation type pump which delivers a constant rate over long periods of time. The rate is variable depending upon the size of the bellows and the position of the adjusting nut. The pump has the desirable feature of having no packing gland or stuffing box, thus eliminating all dangers of contamination of product by lubricants. All connections are machined fits requiring no compounds or gaskets. The unit is 6 by 3½ by 10⅜ inches in size and weighs 5.6 pounds. It utilizes a 110-volt, 60 cycle, 30 rpm motor.

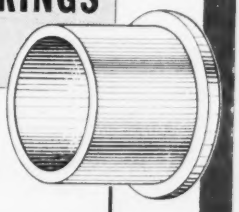
Precision Polishing of Plastic Sheets

R. D. Wood Company, Philadelphia, Penna., has developed a fully automatic 10-opening hydraulic platen press for the precision polishing and laminating of plastic sheets. The complete sheet production unit includes the 880-ton press, a 20-opening elevator

which permits loading and unloading with a minimum of press-idle time, a 2-pressure pumping unit for press and elevator operation, and a fully automatic valve control system covering adjustable control of the press operating cycle together with pressure application and platen temperature regulation. The press operating cycle, with the pressure application, blow-down, and heating and cooling phases are completely controlled from a centralized panel board through adjustment of time-pressure and time-temperature controllers. Absolute assurance of repetitive production of exactly uniform sheets .003 to .750, precise as to thickness, flexibility, and coloring, is maintained.

BRONZE BEARINGS
FOR RUBBER AND PLASTICS MACHINERY

- Approved and used by Industry Leaders.
- Semi-finish machined or complete finished.
- Prompt emergency or stock shipments.
- Price Lists on popular sizes sent on request.



MAGNOLIA METAL COMPANY
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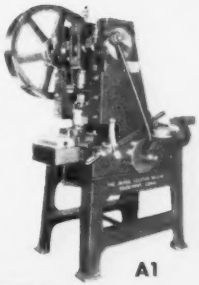
For MORE than Half a Century the name COULTER has meant MORE in higher quality cuttings . . . MORE IN GREATER PRODUCTION. So much MORE that . . .

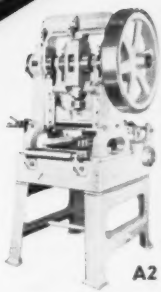


A1

Men who Know PRODUCTION MACHINES Choose

the James COULTER Machine Co.
BRIDGEPORT, CONN.

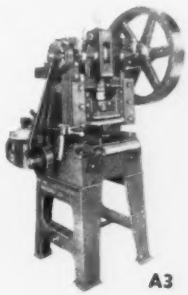
MODEL A-1
Cutting Heels at high speed production or short runs.



A2

MODEL A-2
Cutting Multiple Heels, Half and Full Soles with stock grain.

MODEL A-3
Cutting Multiple Heels and Taps with or across stock grain.



A3

MODEL A-2s
(Not illustrated)
Cutting across grain of stock.

COULTER PRODUCTION MACHINES SINCE 1896

NEW
LABORATORY
MILL

6" x 12" with Anti-Friction Bearings

THE laboratory mill illustrated above was expressly designed as a precision mill for operation at high temperature (650° F).

A self contained lubrication system circulates oil through the roll journal bearings. The use of piston ring type oil seals eliminates oil leaks and the frequent replacement of rubber-based oil seals. Write for specification folder.

Capacity of mill: 2 to 3 pounds
Space required: 28" wide, 60" long.

- *West Coast Rep.:* H. M. Royal, Inc., 4814 Loma Vista Ave., Los Angeles, Cal.
- *Export Agent:* Steinhardter & Nordlinger, 105 Hudson St., N. Y.

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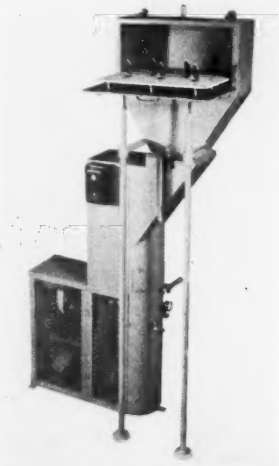
HOSE WIRE

JOHNSON high tensile hose reinforcement wire for braided type reinforcement . . . . . High fatigue vacuum hose reinforcement wire, **Johnson** bronze plate or liquor finish. Galvanized wire for field telephone (U.S. Army specifications) . . . Music wire . . . High carbon specialty wires.

JOHNSON
STEEL & WIRE COMPANY, INC.
Worcester 1, Massachusetts

Campbell Soapstoner-Bagloader

Developed by the Campbell Machinery Development Co. of Cuyahoga Falls, Ohio, and built by the Falls Engineering & Machine Co., also of Cuyahoga Falls, the Campbell Model 1404-8 Soapstoner and Bagloader simplifies loading and "cleans up" dusting operations. In



operation, a bag of soapstone is placed in the box-like top of the Bagloader. The bag rests on spikes which hold it firmly in place. Then the inside edge and end edges of the bag are slit and the lid is closed on the box. The dust drops into the Soapstoner chamber where it is blown out in the extrusion process. With the lid of the top securely closed, no dust can get out to cloud the air and bother the workers. The whole dusting operation is dust-free. When one bag has been emptied into the chamber, another can be placed on top of the Bag-loader ready for use.

to recipes, add...

SEE PAGE 266

SIZE? THICKNESS? COMPRESSIBILITY?

Get the Answers with FEDERAL GAGES

BENCH-TYPE, MODEL 57-B1
Graduated .001", range 1.000", Throat depth 2 7/16".

PORTABLE, MODEL 22P
Graduated .001", range .500", Throat depth 2".

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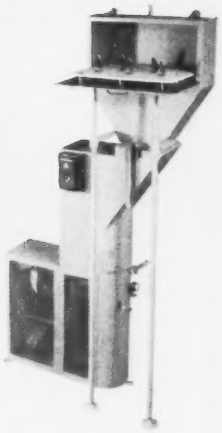

Cleans Up Dirty Operations!

The Campbell Bagloader attached to this Campbell Soapstoner makes dusting of extruded goods a neat-as-a-pin job, keeps air and workers clean, means more production.

Just place a bag of Soapstoner in the top of the Loader. Pierce the bag. Close the lid. There you are. No dust gets out and you've loaded the Soapstoner till the bagful is used.

Compare this *clean* operation to others. Then ask for a quotation on the Bagloader. Write, wire or phone us today.

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Black Rock leads the way with the NEW 4M-48 GUILLOTINE CUTTER for cutting RUBBER—PLASTICS—PAPERBOARD

The 4M-48 (illustrated) cuts material 48" wide, Sheet or Slab stock. Other models cut material widths 18", 24" and 36".
Various types of stock measuring, knife actuating and conveyor arrangements can be supplied.
Send us information on your minimum and maximum requirements . . . it will be a pleasure to quote you!

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On his tough job he can't do without custom-protection of special padding: light for extra speed and split-second saves, tough for sure defense against rushes through mid-ice. His especially-designed padding helps keep his team in the game.

The game of sales is tough too, but your product will move faster with the custom-protection of a Stanley finish. Every product application requires a different finish: when it's created to your exact specifications by Stanley chemists, your product will look better, sell better, and last longer.

Our emphasis at Stanley on "special finishes for special applications" has already helped manufacturers throughout industry to build sales. We'd like to help build yours. Write us about your finishing needs today: The Stanley Chemical Company, East Berlin, Connecticut.

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REVIEWS

BOOKS

Colloidal Dispersions. By Earl K. Fischer. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 6 x 9 in. 388 pp. $7.50.

Developed to supplement the well-known and easily accessible monographs on surface and colloid chemistry, this book, for the first time, covers both the theoretical and practical aspects of colloidal dispersions. The author first discusses the theoretical background for much of the work done in industrial laboratories, particularly that pertaining to particle size, wetting, the state of the dispersed solid, and rheological properties of the dispersed solid. The rest of the book is devoted to manufacturing details involved in the production of colloidal dispersions, with surface-active agents, comminution, mixing, and the operation of all types of mills dealt with in turn. Particular attention is paid to such topics as the dispersion of solids in non-aqueous media, dispersion by phase transfer (the so-called flushing process), and particle size. A brief section is devoted to rubber compounding. The book has 12 chapters and author and subject indexes.

•

Waste Trades Manual and Directory. (1950 Edition). Edited by Gordon Hughes. Published by the British Continental Trade Press, Ltd., 222 Strand, London, W.C. 2, England. Available from J. D. Griffiths, 2 Clark Court, Rutherford, N. J. 5¼ x 8½ in. 330 pp. $4.00.

This is the second edition of the directory and year book of the world's waste material trade and reclamation industry sponsored by the Waste Trade Federation. It is a definite improvement over the first edition (RUBBER AGE, Feb., 1949, p. 626), containing thousands of new names and addresses. Articles on waste trade conditions in various countries of the world are included, contributed by leading authorities. Articles on the scrap rubber industry in the United States were furnished by Henry M. Rose of H. Muehlstein & Co. and M. E. Lerner of RUBBER AGE.

•

A.S.T.M. Standards on Plastics. Published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Penna. 6 x 9 in. 624 pp. $4.85.

The fifth edition of these standards on plastics, sponsored by A.S.T.M. Committee D-20 on Plastics in cooperation with Committee D-9 on Electrical Insulating Materials, presents in convenient, up-to-date form some 120 A.S.T.M. specifications and test methods covering a wide range of plastics and related materials, including much new material. The compilation includes 11 recommended practices, and in addition there are definitions of terms relating to plastics, descriptive nomenclature of objects made from plastics and a code for designating the form of material and direction of testing plastics. Among the molding compound specifications are those covering vinyl and vinylidene chloride.

•

French-English Vocabulary: Technical Terms Used in Connection with Rubber. Rubber Service Department, Imperial Chemical Industries, Ltd., Blackley, Manchester 9, England. 6¼ x 9½ in. 20 pp.

The favorable reception accorded the German-English vocabulary issued by ICI led the company to produce this French-English vocabulary of terms used in the rubber industry. For the most part substantives have been included, with the gender indicated. A number of "coined" technical terms are given, the specific translations of which have frequently been troublesome in the past. This new vocabulary is a welcome addition to the rubber literature.

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Model DF
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Wills thirty-five years experience brings you this outstanding successor to the famous earlier Models D, DE, and DM trimmers.

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TEAR TEST EQUIPMENT

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Good Workmanship

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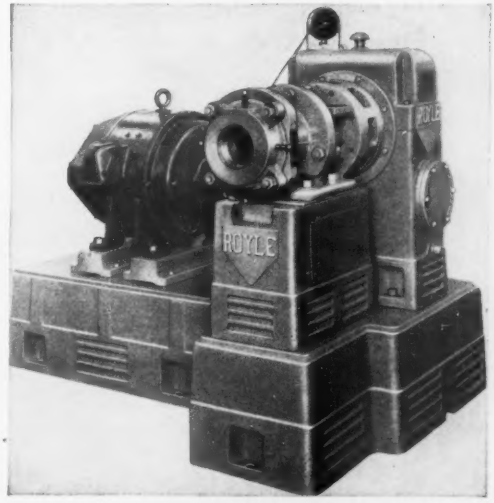
Designed To Extrude RUBBER or PLASTICS

IN these days of rapidly changing developments owners of Royle extruding machines are in the advantageous position of being able to adapt their extruders to either rubber or plastics production. If you are faced with the problem of extruding rubber and plastics the versatility of ROYLE extruders is of paramount importance to you. Whether you require a light or heavy production extruder features have been incorporated to assure maximum results. The change-over is quickly and simply accomplished.

Send for your copy of Bulletin No. 448. It describes these features and how they may be applied to older type extruders.



ROYLE # 2 Extruding Machine. Non-extended cylinder, plain tubing head.

JOHN ROYLE & SONS

ROYLE
PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

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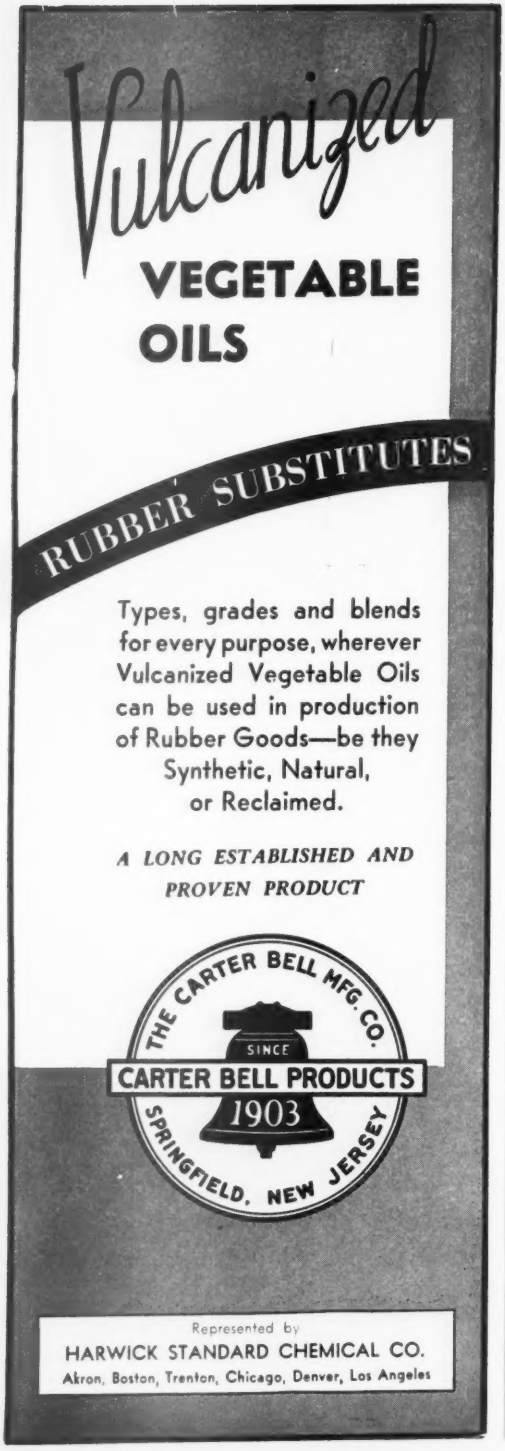
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VEGETABLE
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Types, grades and blends for every purpose, wherever Vulcanized Vegetable Oils can be used in production of Rubber Goods—be they Synthetic, Natural, or Reclaimed.
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SPRINGFIELD, NEW JERSEY
Represented by
HARWICK STANDARD CHEMICAL CO.
Akron, Boston, Trenton, Chicago, Denver, Los Angeles

BOOKLETS, CATALOGS, etc.

German-English Vocabulary: Technical Terms Used in Connection with Rubber. (2nd Edition). Rubber Service Department, Imperial Chemical Industries, Ltd., Blackley, Manchester 9, England. 6¼ x 9½ in. 40 pp.

The first edition of this vocabulary was originally prepared for use in the ICI laboratories, but its reception by the rubber industry was so encouraging that the company decided to make an edition available to the entire industry. Accordingly, this second edition has been prepared and considerably expanded. The vocabulary is generally restricted to substantives, but genders have been added in each case. Some adjectives, of necessity, have been included, but these are clearly described and, in keeping with common German usage, are spelt with small letters. Verbs have been omitted, but abstract nouns derived from them have been included. This German-English vocabulary is a valuable addition to the rubber technical literature.

■

Acceleration of Hi-Sil Compounds with Thiazole-Guanadine Combinations. (Pigment Data Bulletin No. 50-10). Columbia Chemical Division, Pittsburgh Plate Glass Co., Fifth Ave. at Bellefield, Pittsburgh 13, Penna. 8½ x 11 in. 4 pp.

Results of an investigation on Hi-Sil loaded compounds cured with combinations of thiazoles and guanadines are reported in this technical bulletin. Both natural rubber and GR-S compounds are covered, with physicals given on a number of typical compounds. Data is given on both activated and unactivated thiazole-guanadine combinations for the natural rubber stocks and activated combinations for the GR-S stocks. In the GR-S stocks, the thiazole-guanidine combination gave higher modulus, hardness and tear and about the same tensiles as stocks containing thiazole-thiuram combinations.

■

Link-Belt Gearmotors, Motogears and Helical Gear Drives. (Book No. 2247). Link-Belt Co., 307 No. Michigan Avenue, Chicago 1, Ill. 8½ x 11 in. 16 pp.

A new packaged power unit, called the Link-Belt Motogear, consisting of a compact, enclosed helical gear drive with separate standard motor, flexibly coupled and mounted on one welded steel base plate, is described in this booklet. Features of the unit are described. A section of the booklet is devoted to methods of selecting the correct drive for a particular job. Classification of loads is another subject discussed. Specification data is also presented which includes dimensions and other pertinent information. The booklet is illustrated with engineering drawings and photographs.

●

Vinsol Resin in Buna N Adhesives. Hercules Powder Co., Wilmington, Del. 8½ x 11 in. 16 pp.

The expanding use for Vinsol resin in the production of Buna N cements and adhesives is described in this bulletin. While emphasis is placed on what the skilled formulator can do with the product in Buna N cements and adhesives, its use with cements of other types is also discussed. Much of the information contained in the bulletin is presented in tabular form and covers such subjects as stability, curing times, properties, and the effects of acids and alkalis.

■

Geon Polyvinyl Materials. B. F. Goodrich Chemical Co., Rose Building, Cleveland 15, Ohio. 8½ x 11 in. 16 pp.

This manual describes the properties, applications, compounding and processing of Geon materials. Particular emphasis is placed on the many saleable products which can be made from these materials in the flooring, extrusion, film and sheeting, wire and cable and other fields. The manual is illustrated with various photographs and line drawings.

Rubber—An Important Strategic Commodity. Financial Department, Rotterdamsche Bank, Amsterdam, The Netherlands. 8 x 10½ in. 52 pp.

This handsome, illustrated booklet presents an interesting recapitulation of the history of rubber and its increasing importance as a strategic commodity. The rapid growth of production and consumption from rubber's earliest uses is recounted and the situation in which the product found itself after both World Wars is discussed. Attention is paid to the synthetic rubber industry, and the effect it has had or will have on natural rubber. This phase of the discussion takes the question up to the "rubber boom" of 1950, and its resultant effects. The rubber policy of the United States is also discussed, and comparisons made between the natural and synthetic product, particularly as to pricing policies. As rubber, as a raw material, is of great importance to The Netherlands, the economic implications underlying the commodity's sales and production are emphasized. The booklet concludes with a presentation of data on the status of the Dutch economy.

•

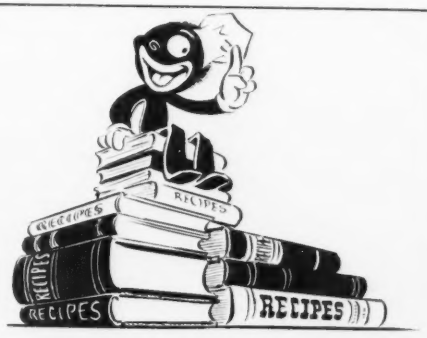
Facts About Oil. Department of Information, American Petroleum Institute, 50 West 50th St., New York 20, N. Y. 8½ x 11 in. 32 pp.

This booklet is an informative summary intended for use as reference and background for those needing a quick, handy guide to up-to-date information on petroleum. The facts and figures are departmentalized for the convenience of the user under the following headings: oil, its origin and progress; exploration, drilling; production; reserves; transportation; refining; supply and demand factors; marketing; uses of oil; cost factors; and oil and national security. Graphs, charts and other drawings supplement the printed matter. A center-spread illustration makes a graphic presentation of supply and demand factors, prewar and today.

•

Eastern Portable Mixers. (Bulletin No. 500). Eastern Industries, Inc., 296 Elm St., New Haven 6, Conn. 8½ x 11 in. 12 pp.

This bulletin contains full operation and performance data on the portable mixers manufactured by the company. Complete engineering specifications are provided for each of the units under discussion. Suggestions are also made as to the factors which should be considered in selecting the proper mixer for a particular assignment. Also considered are the various attachments and motors to be used with the portable mixers. Many of the units described are illustrated. There are also many engineering and diagrammatic drawings.



to recipes, add...

SEE PAGE 266

New Tools for Industry

for MANUFACTURERS of

Textile Finishes
Latex Compounds
Adhesives
Protective Coatings
Saturants

POLYCO 296

SYNTHETIC THICKENER FOR LATICES AND RESIN EMULSIONS

Manufacturers, compounders and consumers of natural and synthetic latices frequently ask us, "Do you have a stable, non-creaming thickener for our emulsions which will give us high viscosities at low concentrations?" Until recently, this perennial problem has been one of the banes of our existence. Now, we are pleased to announce the answer to this problem — POLYCO 296, a synthetic high polymeric thickening agent.

COMPOSITION:
POLYCO 296 is an aqueous solution of the sodium salt of an acrylic acid copolymer.

SPECIFICATIONS:

Concentration	15%
Color	Slight yellow
Turbidity	Slightly cloudy
Viscosity	Over 100,000 cps. @ 25°C
pH	8-9

GENERAL PROPERTIES:
POLYCO 296 can be diluted with hot or cold water to yield solutions with higher viscosities than possible with most commercially available synthetic thickeners. Derived solely from synthetic materials, POLYCO 296 is not subject to the rotting, souring and mildewing commonly encountered with naturally derived gums, proteins and starches.

POLYCO 296 by itself yields tough, elastic, acid-resistant films which do not embrittle or yellow with age. Because of the small quantities of this material required for effective thickening of most latices, film properties of such latices are not significantly altered.

COMPATIBLE WITH:
GRS Latex
Natural Latex
Hycar Latex
Neoprene Latex
Many other Latices and Resin Dispersions

ADVANTAGES:
Heat stable — will not gel at high temperatures.
High viscosities at low concentration.
Non-oxidizing, non-yellowing, flexible films.
Non-creaming, mechanically stable compounds with latices and emulsions.
Resistant to oils, fats, greases and aliphatic solvents.
Will not support bacterial growth.

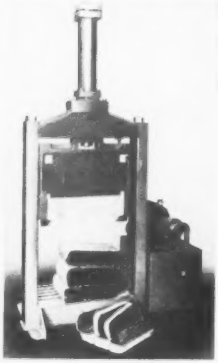
SUGGESTED USES:
1. To thicken latices for dipping, saturating and coating operations.
2. Flexible film former on paper, leather and plastic films.
3. Protective colloid for emulsions and dispersions.
4. Grinding medium for pigments.
5. Addend to emulsions paints.
6. Vehicle for textile printing pastes

Write on your company letterhead for generous working samples and additional information.

POLYCO

AMERICAN POLYMER CORPORATION
PEABODY · MASSACHUSETTS

CRUDE RUBBER BALE CUTTER



Complete Unit

Fully Assembled

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An efficient machine of simple design for cutting bales of crude, synthetic and reclaimed rubber or similar materials. Cuts without aid of water or other lubricant. One man operation—safety control.

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Meticulous workmanship has been a tradition at Brockton Cutting Die for three generations. That's why rubber manufacturers turn to us for quality dies of all kinds . . . for dies that really retain their cutting edge. Our experience and facilities enable us to turn out a cutting die for every type of service.

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BROCKTON CUTTING DIE & MACHINE CO. INC.
CUTTING AND PERFORATING DIES

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REVIEWS (CONT'D)

Steam Jet Syphons. (Bulletin No. 2A). Schutte and Koerting Co., 12th and Thompson Sts., Philadelphia 22, Penna. 8 x 11 in. 24 pp.

This bulletin is divided into three sections. Section 1 details the design, application, construction and operation of the various lines of SK Steam Jet Syphons available. Text material is supplemented by photographs and color drawings showing the operation and working parts of the syphons. For complete information, the sizes, dimensions and capacities of each type are included in tabular form. Special purpose and corrosion-resistant syphons are covered in Section 2 of the catalog. Each special purpose syphon is illustrated and described. Typical applications of steam jet syphons in the pumping, heating and the handling of solids are included in Section 3, of special interest to plant and process engineers. Detailed color drawings accompany the descriptive material.

•

How to Rotate Truck Tires and Get Extra Service. Rubber Manufacturers Association, 444 Madison Avenue, New York 22, N. Y. 8½ x 11 in. 4 pp.

This folder describes and illustrates what happens if truck tires are not rotated, how maximum wear can be obtained through rotation, the effect of mismatched duals on tire loading, and how turning radius affects tire wear. It also explains how to match dual tires and how and when truck tires should be rotated on various truck and tractor combinations.

•

Surface Active Agents and Organic Chemical Specialties. Alrose Chemical Co., Box 1294, Providence 1, R. I. 8½ x 11 in. 8 pp.

Surface active agents and chemical specialties manufactured by the company for use in the rubber and other industries are described in this bulletin. Several new products are listed. Specification data are offered for many of the newer chemicals and their end uses discussed. The bulletin is illustrated with diagrams and photographs.

•

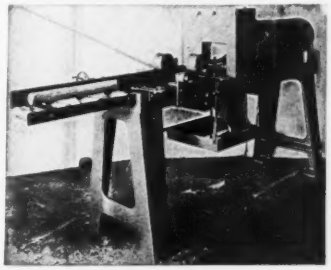
Union Metal Materials Handling Equipment. Union Metal Manufacturing Co., Canton 5, Ohio. 8½ x 11 in. 24 pp.

The company's diversified line of corrugated steel boxes, skids, pallets and combination units are described in this catalog. The most recently designed single units as well as the wide variety of skid-box-pallet combinations are covered and their intended uses discussed. Each of the units is illustrated.

to recipes, add...

SEE PAGE 266

SLICER MACHINE FOR EXTRUDED STOCKS



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ROLL • NEEDLE • MOLD
PYROMETERS

Pioneer Manufacturers of Precision Instruments

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Down-time for changing grinding faces is reduced to a minimum in the FOREMOST grinder. No more time-consuming bolt and nut removal just to expose the grinding chamber. Merely remove one rod, swing away one hinged section and both grinding faces are ready for immediate re-changing.

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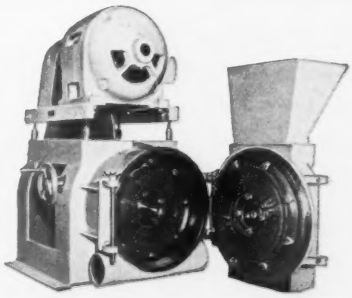
Used in conjunction with the FOREMOST cutter, the 50 hp grinder with gyro screen pulverizes up to 80 mesh.

Automatically fed, with feed adjustment, belt-driven, water-cooled, the grinder has a capacity of 350 to 750 lbs. per hour, depending on material and mesh size.

Grinds Foam Rubber • Sponge Rubber • Rubber Thread • Rubber • Plastics • Cork • Leather • Paper



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Waste Cutting and Grinding Equipment

FOREMOST MACHINE BUILDERS, INC.
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MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, DEC. 8, 1950

Natural Rubber

Continuing its erratic course, the price of rubber on the Commodity Exchange has swung in the wide range of 20 cents since our last report (November 9). High for the period was recorded on November 13, when spot was quoted at 82.50 cents, while the low of 62.00 cents was touched on November 24 and again on November 27. The average price of spot rubber on the Exchange for November was 73.05 cents, based on 20 trading days, which compares with the average of 62.19 cents for October.

Activity in the market has been somewhat reduced in the past several days, with the trade momentarily awaiting the word from Washington with regard to future imports. As reported elsewhere in this issue, the government is weighing a decision to take over imports on an exclusive basis, which probably would result in the sale of natural rubber to the industry at a fixed price, similar to the program which was in effect during World War II.

Early in November the Malayan Government announced an export tax of 52 Straits cents (17c) on rubber exported for $2 Straits (65½c). This aroused a storm of protest from producers and on December 6 the proposed tax was considerably reduced. Under the new plan, effective January 1, the export duty will be 5 Straits cents per pound when rubber sells at 70 Straits cents, and then rise progressively by 2 Straits cents per pound for every 10 Straits cents increase in the price. (Three Straits cents equal one U. S. cent.)

Today's quotations on the outside market, London and Singapore, follow:

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.68
December	.67½
February	.56½
Thin Latex Crepe:	
Spot	.70
February	.59½
Thin Brown Crepe, No. 2	.62
Ambers, No. 3	.62
Flat Bark Crepe	.53

London Market

(Standard Smoked Sheets)

January-March	56.87 - 57.46
July-September	45.79 - 46.37

Singapore Market

(Standard Smoked Sheets)

January	52.57 - 52.90

Synthetic Rubber

(Dry Types-Per Pound)

Butaprene NF	.465 - .475
Butaprene NS	.475 - .485
Butaprene NAA	.515 - .525
Butaprene NXM	.550 - .560
Chemigum 30 N4NS	.400 - .470
Chemigum 50N4NS	.400 - .470
Chemigum N3	.450 - .520
GR-I	—— - .185
GR-S	—— - .185
Hycar OR-25	.450 - .460
Hycar OR-15	.520 - .530
Hycar OS-10	.500 - .510
Neoprene Types CG and AC	—— - .500
Neoprene Type E	—— - .650
Neoprene Types FR and KNR	—— - .800
Neoprene Type GN	—— - .380
Neoprene Type GN-A	—— - .380
Neoprene Type RT	—— - .400
Neoprene Type S	—— - .380
Neoprene Type W	—— - .400
Paracril 18	.430 - .450
Paracril 26	.440 - .460
Paracril 35	.510 - .530
Silastic (compounded)	2.35 - 4.40
Thiokol Type A	.370 - .470
Thiokol Type FA	.520 - .620
Thiokol PR-1	.750 - .850
Thiokol Type ST	.750 - .850

Scrap Rubber

Increasing demand for scrap rubber from reclaimers still continues, as the consumption of reclaim mounts steadily to near-record proportions. Reports from leading scrap rubber dealers indicate that the massive inventories piled up by reclaimers are beginning to be consumed, with the result that reclaimers are again actively in the market for scrap. Although dealers are trying to hold the line on prices, circumstances have forced substantial increases all along the line. Current quotations follow:

Mixed passenger tires	ton	$25.00
Beadless truck tires	ton	40.00
Mixed truck tires	ton	31.00
Beadless passenger tires	ton	32.00
No. 1 passenger peelings	ton	80.00
No. 1 truck peelings	ton	80.00
Red passenger tubes	lb.	.18
Black passenger tubes	lb.	.12
Mixed tubes	lb.	.12
No. 2 truck tubes	lb.	.18
Red truck tubes	lb.	.18
Black truck tubes	lb.	.12
Buffings	ton	35.00

Reclaimed Rubber

Continued high demand for reclaimed rubber due to the general supply picture of new rubber is reflected in the latest R.M.A. statistics. Consumption of reclaim in October is estimated at 31,441 long tons, an increase of 12.82% over the 27,868 tons used in September, and a big jump over the 26,151 tons consumed in August. Although prices on tire reclaims have held steady since our last report (November 9), prices have been increased from 1½ to 5 cents a pound on tube reclaims. Current quotations follow:

Tires

Black, Digester (Natural)	lb.	.10½ - .11
Peels No. 1	lb.	.11 - .11½
Whole Tire (Blend)	lb.	.10 - .10½

Inner Tubes

Black (Natural)	lb.	.24 - .25½
Red (Natural)	lb.	.28 - .28½
Butyl	lb.	.12½ - .13

Cotton Tire Fabrics

The exceedingly tight situation in cotton tire fabrics reported in recent months continues, and few suppliers are even offering quotations. Because of the situation, the entire industry is reported to be concentrating on 12/4/2 standard peelers, the price of which, were it available, is reflected below. The situation is slightly better on chafers, but not to any great extent. No relief is foreseen by the mills for the near future in view of the increasing military demands for tires. Current quotations follow:

Standard, Peeler, 12/4/2	lb.	.95
Extra Staple, Peeler, 12/4/2	lb.	1.00

Chafers

14.4 oz. (per sq. yard)	lb.	.86½
9.25 oz. (per sq. yard)	lb.	.83
11.65 oz. (per sq. yard)	lb.	.81
8.9 oz. (per sq. yard)	lb.	.83½

Cotton

The market for middling uplands on the Cotton Exchange has swung in an orbit of 2.93 cents since our last report (November 9). The high of 44.23 for the period was reached on November 10, with the low of 41.30 being touched on December 4. The average price of middling uplands for the month of November was 43.11 cents, based on 23 trading days. This compares with 40.66 cents for October and 41.62 cents for September.

Current fluctuations in cotton prices reflect the uncertainties concerning price controls and the continued tenseness in the international political situation. This situation is particularly indicated by the large volume of future trading in recent weeks. Persistent rumors of across-the-board ceilings on both commodities and manufactured goods have stirred up renewed buying of forward delivery goods. Based on the increasing need of cotton goods for military usage, the cotton goods market has firmed up considerably.

In a statement issued on December 8, the Department of Agriculture trimmed 61,000 bales off its previous estimate of the 1950 cotton crop, putting it at 9,884,000 bales, a drop of 38% below last year's production of 16,128,000 bales. The 1939-48 average was 11,599,000 bales. This latest official estimate is the last to be made until next spring, when final figures of ginnings will be available. The estimate re-emphasized the fact that the nation's supply of cotton is short and that a sharp increase in production is needed next year. The major factor in decreased production this year is reported to be the cut-back in planting under the Federal crop control program, although poor weather and insects played a part.

Quotations for middling uplands on the Exchange follow:

	Nov. 9 Close	December 8 High	December 8 Low	December 8 Close
March	41.40	41.90	41.68	41.80
May	41.00	41.41	41.21	41.32
July	..	40.84	40.67	40.77

Closing Rubber Prices on New York Commodity Exchange

(No. 1 R.S.S. Contract)

FROM NOVEMBER 10 TO DECEMBER 10

Nov.	Spot	Dec.	Mar.	May	July	Sales
10	81.50	77.25	67.10	57.00	53.00	205
11						
12						
13	82.50	79.90	68.25	59.50	51.00	114
14	81.00	77.50	65.50	55.75	47.00	147
15	73.00	73.50	61.50	51.60	43.00	108
16	74.00	72.15	61.50	53.25	47.00	116
17	74.00	74.00	63.50	56.50	51.00	131
18						
19						
20	70.00	70.00	59.50	52.50	47.00	112
21	67.00	66.00	56.50	50.50	45.00	126
22	67.00	65.25	56.00	50.50	44.80	86
23						
24	62.00	61.25	52.40	47.50	43.00	63
25						
26						
27	62.00	60.00	51.50	47.00	44.00	55
28	69.00	64.00	55.50	51.00	48.00	32
29	72.50	70.00	59.50	54.00	51.00	38
30	73.50	70.75	58.75	53.75	49.50	101
Dec.						
1	73.50	70.00	56.00	50.25	47.75	146
2						
3						
4	64.00	63.50	52.00	46.25	43.75	62
5	69.00	65.00	53.50	47.75	44.50	71
6	70.00	66.50	53.25	48.25	45.00	18
7	70.00	69.00	55.00	49.75	46.50	104
8	69.50	67.00	53.75	48.50	45.50	72
9						
10						

MOLDS AND DIES

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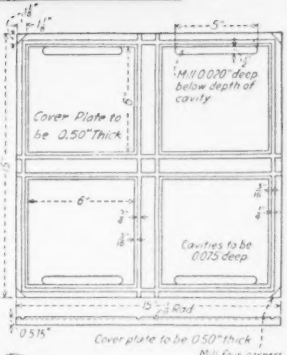
Since 1849

FOR RUBBER TESTING

Single and 4-cavity Molds for making test slabs in stock. Molds for Adhesion test pieces, Abrasion test, Compression samples and Flexing tests molds made to order.


Cover Plate to be 0.50" Thick
Mill 0.020" deep below depth of cavity
Cavities to be 0.075 deep
Cover plate to be 0.50" thick
Mill four corners 1/8 deep for prying mold apart

Standard ASTM and Federal dies for cutting test tensile and tear strength samples and dies for Slab curing carried in stock. Write for complete catalog.

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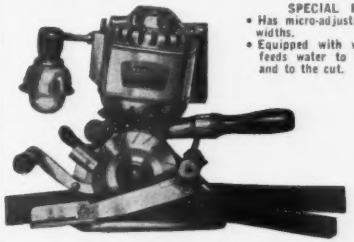
REG. TRADE MARK

RUBBER STRIP CUTTER
PATENTED

A PORTABLE machine capable of stripping slab rubber up to 1" thick at the rate of 20,000 feet in 8 hours. Any width desired.



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- Has micro-adjustment for accurate widths.
- Equipped with water tank which feeds water to the slotted knife and to the cut.
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Cuts within 1/64 inch to 1/100 inch tolerance depending on grades of rubber. Cuts a slab down to the last shaving. Cuts all grades of rubber including pure gum, sponge, etc. Cuts squarely—no rejects.

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CURRENT MARKET PRICES

Of Rubber Chemicals and Compounding Ingredients

DECEMBER 8, 1950

Prices are, in general, f.o.b. works. Range of prices indicates grade or quantity variations.

Abbreviations: bbls., barrels; c.l., carlot; cyl., cylinder; dlvd., delivered; dms., drums; l.c.l., less than carlot; M.B., masterbatch; min., minimum; ref., refined; sap., saponified; sp., special; syn., synthetic; t.c., tank cars.

[a] East of Mississippi.

*For Export Only

—The arrangement of this section follows closely the Chemical Section of the 1949 RUBBER RED BOOK to which readers are referred to determine the classification of any material or brand name. —Although suppliers of every material were contacted for price information, only those materials are listed for which quotations have been furnished us. The quotations are not guaranteed and prospective purchasers should contact suppliers for confirmation before placing orders. Suppliers are requested to send us regularly current prices on all of their materials used in the rubber industry.

ACCELERATORS

A-1 (Thiocarbanilide)	lb.	.44	.51
A-32	**lb.**	**.59**	**.69**
A-77	**lb.**	**.42**	**.55**
A-100	lb.	.42	.55
Accelerator No. 8	lb.	—	.98
Accelerator—49	lb.	.48	.49
Accelerator—89	**lb.**	—	**1.20**
Accelerator—122	**lb.**	—	**1.30**
Accelerator—552	lb.	—	2.00
Accelerator—808	**lb.**	**.59**	**.61**
Accelerator—833	**lb.**	**1.13**	**1.15**
Acro AC-165	**lb.**	**.37**	**.39**
Altax	lb.	.37	.40
Ancap*	lb.	.27	.29
Ancatax*	lb.	.35	.37
Ancazide* ET	lb.	—	1.00
ME	lb.	—	1.10
Ancazate* BU (ET & ME)	lb.	—	1.00
Arazate	**lb.**	—	**2.16**
Beutene	**lb.**	**.59**	**.61**
Bismate, Rodform	lb.	—	3.00
Butasan	**lb.**	—	**1.00**
Butazate	lb.	—	1.00
Butyl Eight	**lb.**	**1.00**	**1.25**
Captax	lb.	.29	.32
C-P-B	lb.	—	1.95
Cumate, Rodform	lb.	—	1.45
Dibenzo G-M-F	lb.	—	2.50
Diorthotolylguanidine	lb.	.52	.53
Diphenylguanidine	lb.	.43	.44
El-Sixty	lb.	.45	.52
Ethasan	**lb.**	—	**1.00**
Ethazate	**lb.**	—	**1.00**
Ethex	lb.	—	1.00
Ethyl Thiurad	**lb.**	—	**1.00**
Ethyl Tuex	**lb.**	—	**1.00**
Ethylac	lb.	.88	.90
G-M-F	lb.	—	2.50
Good-rite Erie	lb.	.31½	.33½
Guantal	**lb.**	**.47**	**.54**
Harvex	lb.	.52	.57
Hepteen	**lb.**	**.42**	**.44**
Base	lb.	1.80	1.85
Ledate, Rodform	lb.	—	1.00
Mercaptobenzothiazole	lb.	.34	.36
Mercaptobenzothiazyl Disulfide	lb.	.42	.44
Mettax	lb.	.44	.51
Methasan	**lb.**	—	**1.00**
Methazate	**lb.**	—	**1.00**
Monex	lb.	—	1.10
Mono Thiurad	**lb.**	—	**1.10**
Morfex	lb.	.59	.61
2-MT	lb.	—	.75
NA-22 (for neoprene)	lb.	—	1.50
O-X-A-F	lb.	.43	.45
Pentex	lb.	—	1.00
Flour	lb.	—	.20
Permalux (for neoprene)	lb.	—	1.85
Phenex	lb.	.40	.45
Pipazate	**lb.**	—	**1.53**
Pip-Pip	lb.	—	1.80
R-2 Crystals	lb.	—	1.75
Rotax	lb.	.42	.44
RZ-50	lb.	—	1.00
SA 52	**lb.**	—	**1.10**
SA 57	**lb.**	—	**1.00**
SA 62	**lb.**	—	**1.00**
SA 66	**lb.**	—	**1.45**
SA 67	**lb.**	—	**1.00**
SA 77	**lb.**	—	**1.00**
Safex	lb.	—	1.15
Santocure	lb.	.61	.68
Selazate	**lb.**	—	**1.45**
Selenac (Ethyl, Methyl)	**lb.**	—	**1.45**
Setsit-5	lb.	.75	1.00
SPDX-GH (tons)	lb.	.64	.66
GL	lb.	—	.95
Tellurac	**lb.**	—	**1.45**
Tepidone	lb.	—	.55
Tetrone	lb.	—	1.25
A	lb.	—	1.55
Thiofide	lb.	.42	.49
Thionex	lb.	—	1.10
Thiotax	lb.	.34	.41
Thiurad	**lb.**	—	**1.10**
Thiuram E	**lb.**	—	**1.00**
M	**lb.**	—	**1.10**
Trimene	lb.	.54	.56
Base	lb.	1.03	1.06
Tuads, Ethyl	**lb.**	—	**1.00**
Tuads, Methyl	**lb.**	—	**1.10**
Tuex	**lb.**	—	**1.10**
Ultex	lb.	1.00	1.05
Unads	**lb.**	—	**1.10**
Ureka Base	lb.	.63	.70
Ureka C	lb.	.68	.75
Vitasan Crystals	**lb.**	**.48**	**.53**
Vulcanex	lb	—	.5[illegible]
Z-B-X	**lb.**	—	**2.45**
Blue Lead, Sublimed (dlvd.)	lb.	.13¾	.14¼
Zenite	lb.	.42	.44
A	lb.	.50	.52
B	lb.	.50	.52
Zenite Special	lb.	.43	.45
Zetax (uncoated)	lb.	.38	.41
Zimate, Butyl	**lb.**	—	**1.00**
Zimate, Ethyl	**lb.**	—	**1.00**
Zimate, Methyl	lb.	—	1.00

ACTIVATORS

Fish Oil, Hydrogenated, Fatty Acid			
Hydrofol Acid (dlvd.)	lb.	.19½	.21¼
Hyfac 430 (dlvd.)	lb.	.20	.21¾
Neo-Fat H.F.O. (dlvd.)	lb.	.14½	.15¾
Stearex Beads (dlvd.)	lb.	.12	.13¾
Lime, Hydrated			
Arrowhead	ton	—	20.65
Marblehead	ton	—	14.30
Sierra	ton	—	19.50
Litharge			
Eagle (dlvd.)	lb.	—	.1875
FSB (dlvd.)	lb.	—	.1975
Magnesium Oxide, Heavy			
General Magnesite 300	lb.	.05	.06½
600	lb.	.06	.08
Michigan No. 15	lb.	.0550	.0600
Permanente	lb.	.05	.06½
Magnesium Oxide, Light			
Baker's (Neoprene Grade)	lb.	—	.31
General Magnesite (Neoprene Grade)	lb.	—	.30
General Magnesite No. 101	lb.	—	.19
General Magnesite Standard	lb.	—	.22
K & M (Neoprene Grade)	lb.	—	.31
Maglite "M" (l.c.l.)	**lb.**	—	**.31**
Marine's (Neoprene Grade (l.c.l.)	lb.	—	.31
Michigan No. 30	lb.	—	.24
No. 40 Extra Light	lb.	—	.31
Witco Extra Light	lb.	.32	.35

ACTIVATORS (Cont'd)

Oleic Acid			
Emersol 210 (dlvd.)	lb.	.21	.23¼
L.C.P. Red Oil	lb.	.21	.23¼
Red Oil (20-24 Saponified) (dlvd.)	lb.	.19	.21¼
Palm Oil Fatty Acid (c.l.)	lb.	.11¾	.14¼
Potassium Oleate (drums)	lb.	.45	.55
Red Lead			
Eagle	lb.	—	.1975
No. 2 RM (dlvd.)	lb.	—	.2075
Sodium Laurate, 75%	lb.	.64	.74
Sodium Oleate, 75%	lb.	.45	.55
Paste (drums)	lb.	—	.20
Sodium Stearate, 75%	lb.	.45	.55
USP Grade (drums)	lb.	—	.37
Stearic Acid, Single Pressed			
Emersol 110 (dlvd.)	lb.	.20½	.21¾
Groco 53	lb.	.20½	.21¾
Stearex B (dlvd.)	lb.	.15½	.16¾
Stearic Acid, Double Pressed			
Alba (dlvd.)	lb.	.23¾	.25½
Groco 54	lb.	.21	.22¼
S-2-A (dlvd.)	lb.	.21	.23¾
S-2-B (dlvd.)	lb.	.19½	.21¾
Stearic Acid, Other			
Neo-Fat 1-58	lb.	.1190	.1315
1-60	lb.	.1400	.1525
1-65	lb.	.1450	.1575
White Lead Basic Carbonate	lb.	.18½	.19½
White Lead Basic Sulfate	lb.	.13¾	.14¾
Zinc Laurate			
Laurex	lb.	.29	.30
Zinc Stearate	lb.	.42	.44
Aquazinc	lb.	.20	.35

Unclassified Activators

Actifat (dms.)	lb.	—	.18
Aktone	lb.	.20	.21
Barak	lb.	—	.60
Curazate	lb.	.57	.59
D-B-A	lb.	—	1.95
Delac J	**lb.**	**.55**	**.57**
Dibutylamine (dlvd.)	lb.	.49	.52½
MODX-B	lb.	.20	.25
NA-11	**lb.**	—	**.65**
Polyac	lb.	—	1.60
Ridacto (drums)	**lb.**	**.22**	**.24**
Snowlite (dlvd.)	lb.	.21	.22½
SOAC (min. 10 dms.)	cwt.	—	8.00
SOAC-KL (min. 10 dms.)	cwt.	—	8.00
Vuiklor	lb.	.75	.85

ANTI-COAGULANTS

Anhydrous Ammonia (l.c.l.)	**lb.**	**.17**	**.21**
Aqua Ammonia (dms.)	lb.	.031	.035
M.B.M. (l.c.l.)	lb.	—	.35

ANTI-FOAMING AGENTS

Aero Anti Foam H	lb.	—	.12½
Regular	lb.	—	.08½
D.C. Antifoam A	lb.	5.65	6.65
Defoamer 630	lb.	—	.12½
Modicol A	lb.	.12	.15
B	lb.	.35	.40

ANTI-OXIDANTS

Agerite Alba	lb.	2.20	2.30
Gel	lb.	.60	.62
Hipar	lb.	.91	.93
H. P.	lb.	.67	.69
Powder	lb.	.49	.51
Resin	lb.	.65	.67
Resin D	lb.	.49	.51
Stalite	lb.	.49	.51
White	lb.	1.40	1.50
Akroflex C	lb.	.67	.69
F	lb.	.67	.69
Aminox	lb.	.49	.51
Antioxidant 2246	lb.	1.60	1.70
Antox	lb.	.49	.51
Aranox	lb.	—	3.25
Benzoquinone	lb.	1.50	1.75
Betanox Special	lb.	.70	.72
B-L-E	lb.	.49	.51
Carvacrol	lb	—	.75
Deenax	lb.	.95	1.05
Eugenol C 95%	lb.	—	1.65
Flectol H	lb.	.49	.56
Flexamine	lb.	.67	.69
Hydroquinone	lb.	—	.90
Neozone Standard	lb.	—	.82
A	lb.	.51	.53
C	lb.	—	.67
D	lb.	.49	.51

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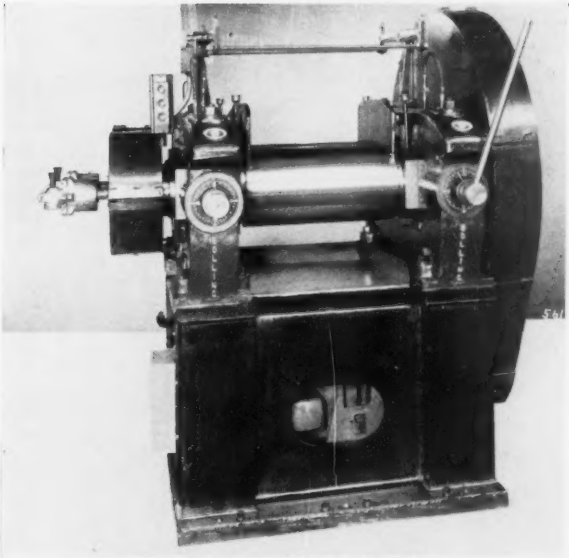

Illustration Frame #3. 12-12 x 24" (or 30") Mill on cabinet type base. Under-mounted motor.

RUBBER MILLS

MODERN DESIGNS — LATEST IMPROVEMENTS. A COMPLETE LINE OF SIZES FROM 2½" x 7" LABORATORY MILLS TO 84" PRODUCTION MILLS
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BALE SPLITTERS — PUMP UNITS
VULCANIZERS

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STEWART BOLLING & COMPANY INC.

3190 E. 65TH ST. CLEVELAND 27, OHIO

ANTI-OXIDANTS (Cont'd)

Oxidex	lb.	—	3.00
Parazone	**lb.**	**—**	**.75**
PDA-10 and 20	lb.	.36	.38
Permalux	lb.	—	1.85
Resorcin, Tech. (dlvd.)	**lb.**	**—**	**.64**
Santoflex AW	lb.	.66	.73
B	lb.	.49	.56
BX	lb.	.60	.67
.35	lb.	.67	.74
Santovar-A	lb.	1.40	1.47
O	lb.	1.20	1.27
Santowhite Crystals	lb.	1.55	1.62
Santowhite L	lb.	.49	.56
MK	lb.	1.25	1.32
S.C.R. (tons)	**lb.**	**.32**	**.34**
Sequa-trene AA	lb.	—	1.00
NA2	lb.	—	.82
NA5	lb.	—	.80
Stabilite	lb.	.49	.51
Alba	lb.	.69	.74
L	lb.	.60	.62
White	lb.	.49	.51
Stabilizer No. 1	lb.	—	1.55
Stabilizer No. 320	lb.	—	.75
Sumolite	lb.	.20	.23
Tannic Acid, Tech.	lb.	**.46**	.48
Thermoflex	lb.	1.61	1.63
A	lb.	.98	1.00
V-G-B	lb.	.65	.67
Wing-Stay S	lb.	.48	.49

ANTI-SCORCHING AGENTS

Armeen HT	lb.	.34	.42
Benzoic Acid—Tech.	**lb.**	**—**	**.43**
Good-rite Vultrol	lb.	.55	.57
Sodium Acetate 60-62% Crystals	**lb.**	**—**	**.06**

ANTISEPTICS AND GERMICIDES

Arquad S	lb.	.22	.25
Formaldehyde (dms.)	lb.	—	.062
G-4 (bbls.)	lb.	.95	2.95
G-11	lb.	—	3.45
Nuodex 100 S.S. (dlvd.)	**lb.**	**—**	**1.05**
Nuodex 100 W.D. (dlvd.)	lb.	—	1.20
Nuodex Zinc 8% (dms.) (dlvd.)	lb.	—	.2125
Ortho Cresol (26°-27°)	**lb.**	**—**	**.18**
Retarder D	lb.	.42	.50
Soligen Drier—Copper 8% (drums)	lb.	—	.22½
Zinc 8% (dms.)	lb.	—	.21¼
Vancide	lb.	—	**.80**

ANTI-WEBBING AGENTS (for Latex)

Webnox 33	lb.	1.50	2.25
34	lb.	1.75	2.25

AROMATICS (DEODORANTS)

Bouquet 149	lb.	—	3.00
Coumarin	lb.	—	2.75
Curodex 19	lb.	—	4.75
188	lb.	—	5.75
198	lb.	—	6.75
D-6 Masking Perfume	lb.	—	1.35
Deodorant 65	lb.	—	1.00
Deodorant L-37	lb.	2.00	2.40
L-44	lb.	2.50	2.90
N.L.T.X.	lb.	1.85	2.15
Deodorant Oil GD 3427	lb.	1.70	2.00
4440	lb.	3.00	3.50
5296	lb.	1.30	1.60
General Deodorant 18301.	**lb.**	**—**	**2.40**
Latex Perfume 5	lb.	—	3.25
6	lb.	—	7.50
9	lb.	—	.65
Naugaromes (dms.)	**lb.**	**1.50**	**3.00**
Neutrodor 31	lb.	2.00	2.50
Neutroleum Delta	lb.	—	2.60
Gamma	lb.	—	2.60
Parador A	**lb.**	**1.75**	**2.25**
B	**lb.**	**.70**	**1.00**
C	**lb.**	**2.75**	**3.25**
D	**lb.**	**1.50**	**2.00**
E	**lb.**	**.25**	**.55**
F	lb.	.32	.47
GD 5280	lb.	2.00	2.50
GD 5348	**lb.**	**1.90**	**3.25**
J	lb.	1.95	2.25
K	lb.	.45	.60
Perfume Oil Bouquet Vanilla M	lb.	2.40	2.75
Resodor 11	lb.	2.00	2.50
12	lb.	1.45	1.75
Rodo No 0	**lb.**	**4.00**	**4.50**
No. 10	**lb.**	**5.00**	**5.50**
Rubbarome (dms.)	lb.	1.00	3.80
Rubber Perfume 12	lb.	—	2.85
Russian Leather 7	**lb.**	**—**	**4.10**
Vanillin	lb.	3.00	4.05

BLOWING AGENTS

Ammonium Bicarbonate (dlvd.)	**lb.**	**.072½**	**.1075**
Blowing Agent CP-975	**lb.**	**—**	**.35**
Sodium Bicarbonate, U.S.P. (c.l., bags)	cwt.	—	1.95
Sponge Paste	**lb.**	**—**	**.20**
Unicel	lb.	—	.82
ND	lb.	—	1.40
S	lb.	—	.20
Urea	lb.	.0425	.0475

BONDING AGENTS

Durez 12987	lb.	.48	.53
Interlake Resin No. 4162	lb.	—	1.50
MDI	**lb.**	**7.00**	**7.75**
50	**lb.**	**3.50**	**4.00**
Pliobond 20	gal.	2.75	4.00
30	gal.	3.45	4.70
Reanite	gal.	6.75	7.25
Rex Compounds	**gal.**	**1.30**	**2.85**
Ty-Ply Q (BN & S)	gal.	6.75	8.00

COAGULANTS

Acetic Acid—56% (bbls.)	cwt.	8.11	8.61
Glacial—99½% (bbls.)	cwt.	14.05	14.55
Calcium Nitrate, Tech. Crystals	lb.	.07	.17
Hydroxyacetic Acid—70% (dms.)	lb.	—	.084
Zinc Nitrate, Tech.	lb.	—	.22½

COLORING AGENTS

Black

Aquablak B (also M, R)	lb.	.0725	.0875
Aquablak S	**lb.**	**.08½**	**.09**
Black Shield 4-35 (dms.)	lb.	—	.0825
Carbon Black—See *Reinforcing Agents*			
Lampblack No. 10	lb.	.06	.09
Mapico Black Iron Oxide (50 lb. bags)	lb.	.1100	.1125
Raven Black Pure Iron Oxide	cwt.	11.00	11.25

Blue

Blue GD, Dispersed	lb.	—	4.55
Blue GD Paste	lb.	—	1.80
Blue YD, Dispersed	lb.	—	2.75
Milori Blue 11840 (dlvd.)	lb.	—	.37
Monastral Fast Blue CPL	lb.	—	1.77
PCD, Dispersed	lb.	—	2.50
Ramapo Blue	lb.	3.40	3.45
Rubber Blue X-1999	lb.	—	1.15
Stan-Tone Blue	lb.	1.40	4.00
Ultramarine	lb.	.14	.30
Vansul Blue M.B.	lb.	.90	2.40
Victoria Blue BP-262-D	lb.	2.25	2.30

Brown

Brown Iron Oxide	lb.	.12	.1225
Mapico Brown (50 lb. bags)	lb.	.1225	.1250

Green

Filo Green D-700 (and D-705)	lb.	—	.30
Green Chromium Oxide, Pure	cwt.	34.50	40.50
Green Chromium Oxide, Pure, Hydrated	cwt.	85.00	100.00
Green FD, Dispersed	lb.	—	1.85
Monastral Fast Green GSD, Dispersed	lb.	—	3.20
GSL	lb.	—	1.97
Permansa Green CP-594	lb.	—	1.35
Pigment Green B	lb.	—	1.35
GL-652D	lb.	.88	.93
Ramapo Green	lb.	—	4.00
Rubber Green X-1292	lb.	—	1.00
Stan-Tone Green	lb.	1.50	3.30
Vansul Green M.B.	lb.	1.05	2.45

Maroon

Stan-Tone Maroon	lb.	3.00	3.05
Vansul Maroon M.B.	lb.	1.05	2.80

Orange

Molybdate Orange	lb.	—	.45
Orange FD, Dispersed	**lb.**	**—**	**2.75**
Rubber Orange X-2065	lb.	—	2.60
Stan-Tone Orange	lb.	1.65	4.00
Vansul Orange M.B.	lb.	2.15	3.15

Red

Antimony Trisulfide	**lb.**	**.55**	**.68**
R. M. P. Sulfur Free	**lb.**	**.63**	**.68**
R. M. P. No. 3	lb.	.55	.60
Cadmium Red	**lb.**	**.95**	**1.25**
Cadmolith Red (bbls.)	lb.	1.30	1.55
Graphic Red (dlvd.)	lb.	—	.80
Indian Red, American, Pure	cwt.	11.75	12.00
Doxco (English)	cwt.	11.50	11.75
Mapico Reds (50 lb. bags)	lb.	.1175	.12
Oximony Iron Oxide	**lb.**	**—**	**.09**
Red Iron Oxide, Light	cwt.	11.75	12.00
Red PBD, Dispersed	lb.	—	1.75
2BD, Dispersed	lb.	—	1.80
2BL	lb.	—	1.32
PBL	lb.	—	1.65
Rubanox Red CP-762 (dlvd.)	**lb.**	**—**	**1.40**
Rubber Red CP-339 (dlvd.)	lb.	—	1.05
Rubber Red RT-364	lb.	—	.75
Rubber Red RT-425	lb.	—	.75
Rubber Red X-1148	lb.	—	.80
Rubbered	lb.	.1150	.1175
Solfast Red CP-663 (dlvd.)	lb.	—	1.80
CP-787 (dlvd.)	lb.	—	1.30
Stan-Tone Red	**lb.**	**1.10**	**3.05**
Sun Burnt Red	lb.	.1150	.1175
Vansul Red M.B.	lb.	.90	2.60
Watchung Red	lb.	—	1.90

White—Lithopone

Albalith	lb.	.07½	.08½
Astrolith	lb.	.06½	.07¼
Cryptone BT	lb.	.0958	.1058
Eagle	**lb.**	**.06¼**	**.06½**
Permalith	**lb.**	**.06¼**	**.06¾**
Ponolith	lb.	.07	.07¾
Sumolith	lb.	.06½	.07¼

White—Titanium Pigments

Ti-Cal	lb.	.08½	.09
Ti-Pure	**lb.**	**.21½**	**.22½**
Titanox A—all grades (dlvd.)	**lb.**	**.19½**	**.20½**
RA (dlvd.)	lb.	.21½	.22¼
RA-10 (dlvd.)	lb.	.21½	.22¼
RA-NC (dlvd.)	lb.	.21½	.22¼
RC (dlvd.)	lb.	.07¼	.08¼
RC-HT (dlvd.)	lb.	.07½	.08
Unitane O-220	**lb.**	**.195**	**.205**
OR-250	**lb.**	**.215**	**.225**
Zopaque	**lb.**	**.19½**	**.20¼**

White—Zinc Oxide (American Process)

AZO-ZZZ 11 (and 22, 33, 44, 55)	lb.	.16	.17
Eagle	lb.	.16	.17
Horse Head Special	lb.	.16	.17
XX Red	lb.	.16	.17
XX-505	lb.	.17½	.18½
Protox 166	lb.	.16	.17
167	lb.	.16	.17
St. Joe Black Label	lb.	.16	.17
Green Label	lb.	.16	.17
Red Label	lb.	.16	.17

White—Zinc Oxide (Dispersed)

Dispersed Zinc Oxide	lb.	—	13

White—Zinc Oxide (French Process)

AZO-ZZZ 66	lb.	.18¼	.19¼
Eagle Green Seal	lb.	.17¼	.18¼
Eagle Red Seal	lb.	.17¼	.18¼
Eagle White Seal	lb.	.18¼	.19¼
Florence Green Seal	lb.	.17¾	.19¾
Red Seal	lb.	.17¼	.18¼
White Seal	lb.	.18¼	.19¾
Kadox 25	lb.	.18¼	.19¼
Kadox 15, 17 and 72	lb.	.16	.17
U. S. P. 12	lb.	.19¼	.20¼

White—Zinc Sulfide

Cryptone ZS-800	lb.	.24	.25

Yellow

Anchor Brand Pure Iron Oxide	cwt.	9.00	9.25
Cadmolith Yellow (bbls.)	**lb.**	**—**	**.95**
Chrome Yellow	lb.	—	.32
Chrome Yellow 12310	lb.	—	.28
Ferrox	cwt.	7.50	8.50
Mapico Yellow (50 lb. bags)	lb.	.0950	.0975
Rubber Yellow X-1940	**lb.**	**—**	**1.60**
Stan-Tone Yellow	lb.	1.00	2.25
Toluidine Yellow	lb.	—	1.91
YL-556-D	lb.	—	.82
Oximony Iron Oxide	**lb.**	**—**	**.06¾**
Vansul Yellow M.B.	lb.	.95	1.55
Yellow GD, Dispersed	lb.	—	2.15
GL	lb.	—	1.62
Zinc Yellow	lb.	—	.27

DISPERSING AGENTS

Anchinol*	lb.	.24	.25
Armeen 18	lb.	.42	.50
Darvan No. 1 (and No. 2)	lb.	.21	.40
Daxad 11 (21, 23)	**lb.**	**.08**	**.35**
Dispersaid	**lb.**	**1.25**	**1.35**
Furala	lb.	.06½	.07¾
Halloid	lb.	.04½	.05½
Marasperse C	lb.	.06	.06½
CB	lb.	.11½	.13¾
N	lb.	.09	.10
Modicol C	lb.	.08	.12
Rubbex	**lb.**	**—**	**.27¾**
Stan-Chem BQC	**lb.**	**.12¼**	**.17¾**
1067	lb.	—	.13½
1471	lb.	.1687	.2187
2251	lb.	.12¼	.17¾
Trenamine D-25	**lb.**	**.32½**	**.36**
Triethanolamine (drums) (dlvd.)	lb.	.21½	.22¼
Yelkin TT	lb.	.14	.18
Zinsper	lb.	—	.15

EXTENDERS

Advagum 1098	lb.	—	.64
Bunaweld Polyester No. 780	**lb.**	**—**	**.22**
No. 5514	lb.	—	.33
D-92 (and D-93) (dms.)	lb.	—	.12
Extender 600	lb.	—	.1480
PR-162 Latex (dms.)	gal.	1.00	1.60
Synprolac	lb.	—	.19
Synprowax	lb.	.16	.19
Vistanex	lb.	—	.32

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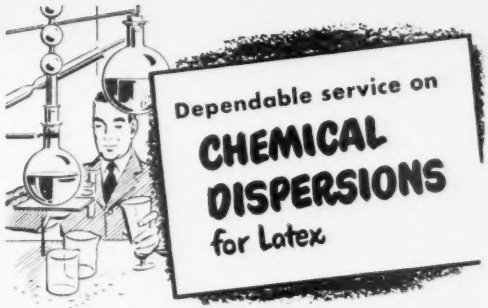

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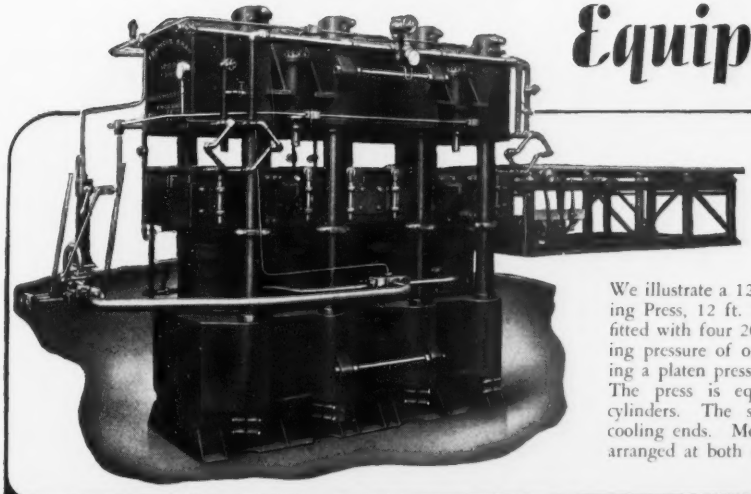

We illustrate a 1250 ton single daylight Sheeting Press, 12 ft. long by 3 ft. 6 inches wide, fitted with four 20" rams, suitable for a working pressure of one ton per square inch, giving a platen pressure of 450 lbs. per sq. inch. The press is equipped with four opening cylinders. The steel steam chests have 9" cooling ends. Motor driven drawtable can be arranged at both ends of the press if desired.

FRANCIS SHAW & CO. LTD. MANCHESTER II ENGLAND

FILLERS (Inert and Reinforcing)

Abrasives			
Carbonite	lb.	.15	- .95
Lionite	lb.	.09¾	- .90
Pumice	lb.	.03	- .05
Aluminum Hydrate	lb.	.07	- .10
Aluminum Silicate			
Marter White	ton	18.50	- 30.00
Barium Carbonate (l.c.l.)	ton	72.50	- 90.00
Barytes			
No. 1 Floated, White	ton	37.60	- 52.40
No. 2 Floated, Unbleached	ton	35.60	- 50.40
No. 22 Barytes (c.l.)	ton	——	- 18.37
Foam A	ton	——	- 34.85
Bentonite (c.l.)	ton	——	- 11.50
SPV Volclay (c.l.)	ton	——	- 11.50
Blanc Fixe	ton	72.50	-120.00
Calcium Carbonate			
Atomite (c.l.)	ton	——	- 30.00
B.I. White No. 1 (c.l.)	ton	——	- 7.50
B.I. White No. 2 (c.l.)	ton	——	- 7.00
Blue Star XX	ton	——	- 15.50
Calcene T	ton	60.00	- 70.00
Caltec	ton	40.00	- 57.50
Calwhite	ton	——	- 17.00
Camelwite	ton	——	- 30.00
Gamaco	ton	——	- 30.00
Kalite (c.l.)	ton	——	- 50.00
Laminar	ton	——	- 30.00
Lesamite (c.l.)	ton	——	- 27.50
Millical (c.l.)	ton	——	- 32.50
Multifex	ton	——	-105.00
Non-Fer-Al	ton	——	- 25.00
Purecal M	ton	45.00	- 60.00
U	ton	120.00	-135.00
Sierracal	ton	15.00	- 18.50
Super Multifex	ton	——	-160.00
Surfex (c.l.)	ton	——	- 35.00
Suspensa (c.l.)	ton	——	- 30.00
Witcarb R (c.l.)	ton	110.00	-120.00
R-12 (c.l.)	ton	71.00	- 76.00
York White	ton	——	- 9.00
Calcium Silicate			
Silene EF	ton	120.00	-130.00
L	ton	125.00	-135.00
Calcium Sulfate, Anhydrous			
Snow White Filler	ton	——	- 18.00
Calcium Sulfate, Hydrous			
Crysta-Cal (c.l.)	ton	——	- 12.50
Terra Alba No. 1	ton	12.00	- 14.40
Chalk Whiting (l.c.l.)	lb.	.0150	- .0175
Recco Paris Whiting	ton	——	- 28.00
Clay			
Alsilite (c.l.)	ton	14.00	- 22.50
Alsite (c.l.)	ton	——	- 14.00
Aluminum Flake	ton	22.50	- 60.00
A.S.P. No. 1 (c.l.)	ton	——	- 35.00
No. 11 (c.l.)	ton	——	- 40.00
Buca (c.l.)	ton	——	- 45.00
Burgess No. 20	ton	——	- 35.00
No. 30	ton	——	- 37.00
Burgess Iceberg	ton	——	- 50.00
Burgess Polyclay	ton	——	- 45.00
Catalpo (c.l.)	ton	——	- 35.00
Champion	ton	——	- 14.00
C & D. (c.l.)	ton	——	- 13.50
Crown	ton	——	- 14.00
Dixie (c.l.)	ton	——	- 14.00
Hi-White R	ton	——	- 13.50
Hydratex R	ton	——	- 30.00
Kaolloid Clay (c.l.)	ton	——	- 10.50
Markham (c.l.)	ton	14.00	- 35.00
McNamee (c.l.)	ton	——	- 13.50
Oldham (c.l.)	ton	13.50	- 35.00
Paragon	ton	——	- 13.50
Pigment 5	ton	21.85	- 36.00
Pigment 22	ton	16.50	- 22.50
Pigment 33	ton	——	- 37.00
Recco (c.l.)	ton	——	- 14.00
RX-43	ton	——	- 33.00
Stan-Clay	ton	25.00	- 30.00
Stellar-R	ton	——	- 50.00
Suprex	ton	——	- 14.00
Upton	ton	19.50	- 21.50
Whitetex (c.l.)	ton	——	- 50.00
Diatomaceous Earth	ton	30.00	- 50.00
Kaylorite (c.l.)	ton	——	- 30.00
Lorite	ton	——	- 30.00
Flock			
Cotton, white and colored	lb.	.10	- .22
Filfloc F 40-9000	lb.	——	- .16
Filfloc F 6000	lb.	——	- .22
Polycel	ton	145.00	-178.00
Rayon, bleached or dyed	lb.	.81	- 1.50
Rayon, grey	lb.	——	- .18
Rayon, pink	lb.	——	- .14
Solka-Floc (l.c.l.)	lb.	.05½	- .15
Wool, bleached or dyed	lb.	.70	- 1.00
Glue, Bone (dlvd.)	lb.	.18	- .20½
Leather, Shredded	lb.	.05	- .17
Lignin	lb.	.03	- .06
Indulin	lb.	.09	- .10
Limestone, Pulverized	ton	3.25	- 10.00
Industrial Filler No. 100 ton		——	- 5.75
Micro Velva	ton	45.00	- 47.00
Velvet Filler, Regular	ton	20.00	- 22.00
Magnesium Carbonate	lb.	.0950	- .1050
K & M Clearcarb	lb.	.1225	- .1275
Magnesium Oxide	lb.	.05	- .06
Magnesium Silicate	ton	18.00	- 35.00
Airex	ton	25.00	- 27.00
Asbestol	ton	20.00	- 22.00
Blue Star Talc	ton	——	- 23.00
L.S. Silver	ton	23.50	- 25.50
Sierra White	ton	21.25	- 23.25

FILLERS (Cont'd)

Mica	lb.	.01¼	- .07¾
Concord	lb.	.07	- .07¾
Micro-Mica	lb.	.06¼	- .07½
Mineralite (c.l.)	ton	25.00	- 40.00
Silversheen	lb.	.07	- .07¾
Triple A Mica (c.l.)	ton	——	- 25.00
Vermiculite	lb.	.075	- .085
Wet Ground Biotite			
Mica	lb.	.05½	- .06¼
Wet Ground Mica			
No. 160	lb.	.07	- .07¾
Pyrophyllite			
Pyrax A (c.l.)	ton	——	- 12.50
WA (c.l.)	ton	——	- 15.00
Silica	ton	16.00	- 27.00
Blue Star	ton	——	- 20.00
Slate, Powdered (l.c.l.)	ton	15.00	- 20.00
Talc, Domestic	ton	10.00	- 27.00
Nytal 200	ton	23.00	- 40.00
300	ton	35.00	- 52.00
Walnut Shell Flour	ton	45.00	-111.00
Whiting, Commercial	ton	——	- 7.00
Cameline (c.l.)	ton	8.50	- 10.00
C-C-O White	ton	——	- 17.00
Keystone (c.l.)	ton	——	- 16.00
Rambo No. 1 White	ton	——	- 8.50
No. 6 White	ton	——	- 9.00
Snowflake (c.l.)	ton	——	- 18.00
Veroc (c.l.)	ton	——	- 8.50
Welco (c.l.)	ton	——	- 7.50
York White R (c.l.)	ton	——	- 8.00
Wood Flour	ton	22.00	- 49.00

FINISHING MATERIALS, SURFACE

Beaco Finishes	gal.	2.10	- 2.35
Black Out	gal.	4.50	- 8.00
Shellac, Orange Gum	lb.	.45	- .54
VanWax	gal.	1.25	- 1.30

FLAME RETARDANTS

Cellulfux	lb.	.36½	- .38½
Chlorinated Paraffin 42	lb.	——	- .12¼
Halowax	lb.	.24	- .39
Zinc Borate 3167	lb.	.18½	- .19½
Zytrox	lb.	.50	- .79

LUBRICANTS, MOLD

Aquadag	lb.	3.50	- 4.00
Aquarex D	lb.	——	- .76
L Paste	lb.	——	- .85
MB	lb.	——	- .92
MDL Paste	lb.	——	- .30
WA Paste	lb.	——	- .25
Akro Gel	lb.	——	- .165
Borax, Granular (l.c.l.)	ton	81.00	- 86.00
Carbowax 4000	lb.	.31	- .35
Colite Concentrate (dms.)	gal.	——	- .90
Concentrex	lb.	——	- .25
D.C. 7 Compound	lb.	6.20	- 6.80
D.C. Emulsion No. 35	lb.	1.68	- 3.50
35A	lb.	1.68	- 3.50
35B	lb.	1.68	- 3.50
D.C. Mold Release Fluid	lb.	4.14	- 6.00
Dipex	lb.	.14	- .18
Dri-Lube	lb.	——	- .22
Glydag	lb.	1.30	- 2.00
Hawkeye Flake (dlvd.)	lb.	——	- .12
Kokobace	lb.	——	- .12
Latex-Lube GR (dlvd.)	lb.	.18½	- .19¼
R-66 (dlvd.)	lb.	——	- .15
Liqui-Lube (dlvd.)	lb.	——	- .14¾
NF (dlvd.)	lb.	——	- .15¼
NT (dlvd.)	lb.	——	- .15⅜
Lubrex	lb.	.25	- .30
Lubri-Flo	gal.	10.00	- 12.00
Migralube	lb.	——	- .35
Mold Lubricant No. 72			
Conc	gal.	2.50	- 4.00
No. 735	gal.	1.36	- 2.75
Moldeze No. 1	gal.	——	- 36.00
No. 3	gal.	——	- 7.50
Mold-Brite	gal.	——	- 1.50
Mold-Slick	lb.	.202	- .215
Mold-White	gal.	——	- 2.00
Nopcolube	lb.	——	- .15
Orvus WA Paste (dms.)	lb.	——	- .25
Prodag	lb.	.28	- .42
Purity Flake (dlvd.)	lb.	——	- .14
Redotex Flakes (dlvd.)	lb.	.19⅛	- .20
Powder (dlvd.)	lb.	.20⅛	- .20½
Rubber-Flo	gal.	1.15	- 1.50
Rubber-Glo	gal.	——	- .94
Rusco Mold Paste	lb.	——	- .25
Sericite (l.c.l.)	ton	65.00	- 75.00
Thermalube	lb.	——	- .11
Ulco Mold Soap	lb.	.12	- .23
Ucon Lubricants	lb.	.27½	- .35½
Werkrite Flakes (dlvd.)	lb.	.17⅝	- .18
Powder (dlvd.)	lb.	.18⅛	- .18¾

LUBRICANTS, RUBBER

Extrud-o-Lube	gal.	——	- 1.57
G.B. Naphthenic Neutrals	gal.	.11	- .18
Propylene Stearate (dms.)	lb.	.68	- .78

LUBRICANTS, RUBBER SURFACE

Barium Stearate	lb.	.42	- .44
Calcium Stearate	lb.	.40	- .42
Glycerized Lubricant	gal.	——	- 1.25
Polyethylene Glycol	lb.	——	- .23
Rexanol	lb.	——	- .13
Separex	lb.	——	- .25
Slab-Dip	lb.	——	- .15
Wet-Zinc	lb.	——	- .23¼
Zinc Stearate	lb.	.42	- .44

MOLD CLEANERS

Actusol (dlvd.)	gal.	1.40	- 1.60
Metso 99	cwt.	4.00	- 5.85
Granular	cwt.	3.50	- 5.15
Rubber-Sol	gal.	2.75	- 3.25
Shellblast	ton	80.00	-140.00
Sprex A.C. (dlvd.)	lb.	.13¾	- .15½

PEPTIZING AGENTS

Peptizer P-12	lb.	.84	- 1.00
RPA 2	lb.	——	- .75
3	lb.	——	- .46
3-RO	lb.	——	- .49
5	lb.	——	- .57

PLASTICIZERS & SOFTENERS

AA (drums)	lb.	.25	- .26¾
Acto 500	lb.	——	- .09
Adipol BCA (dms.)	lb.	.43½	- .44
2EH	lb.	.42	- .43
10A	lb.	.42	- .43
American Pine Tar	lb.	.0350	- .0473
Arneel	lb.	.22	- .27
Arolene 1980 (c.l.)	lb.	——	- .10
Aromatic Tar	gal.	.0573	- .1973
Bardol	lb.	.02½	- .03½
B	lb.	.05¾	- .06
Bayol D	gal.	——	- .382
F	gal.	——	- .52
Beeswax, Refined &			
Bleached	lb.	.60	- .65
Yellow Refined	lb.	.52	- .55
Bondogen	lb.	.55	- .60
B.R.C. No. 20	lb.	.0150	- .0160
B.R.H. 2	lb.	.0280	- .0290
BRS 700	lb.	.0175	- .0260
B.R.T. 3	lb.	.024	- .025
4	lb.	.0225	- .0235
7	lb.	.0265	- .0275
B.R.V.	lb.	.0350	- .0515
Bunarex Resins	lb.	.05½	- .06¼
Bunatak AH	lb.	.08	- .09
U	lb.	——	- .15
No. 90	lb.	——	- .08
No. 210	lb.	——	- .12
Burgundy Pitch	lb.	.0843	- .0888
Butac	lb.	.10½	- .11½
Butoxyethyl Diglycol Carbonate	lb.	.40	- .41
Butyl Benzyl Sebacate	lb.	.61	- .63¾
Butyl Carbitol Perlargonate (dms.)	lb.	——	- .64½
Butyl Cellosolve Perlargonate (dms.)	lb.	——	- .68
Butyl Palmitate	lb.	——	- .26¾
Butyl Roleate	lb.	.176	- .18
Butyl Stearate-CP (dms.)	lb.	.31	- .33¾
BWH-1	lb.	——	- .14
Cabflex Di-BA (dms.)	lb.	.38½	- .39½
Di-OA (dms.)	lb.	.42	- .43
Di-OP (dms.)	lb.	.37½	- .38½
Califlux 510, 550	lb.	.025	- .0325
G.P.	lb.	.0125	- .02
R-100	lb.	.04¾	- .05¼
TT	lb.	.02	- .02¾
Candelilla Wax Prime	lb.	.67	- .75
Caprvl Benzyl Sebacate	lb.	.67½	- .70¾
Carbonex	lb.	.0325	- .0375
S Flakes	lb.	.04	- .0475
S Plastic	lb.	.0410	- .0460
644	lb.	.0375	- .0425
Carbowax 4000 (drums)	lb.	——	- .29
Cardolite 615	lb.	.33¾	- .36¾
816	lb.	.25¾	- .28¾
Carnauba Wax, Crude	lb.	.80	- 1.04
Refined	lb.	.87	- .94
Substitute	lb.	.45	- 1.08
Yellow	lb.	1.15	- 1.20
Cellulfex (dms.)	lb.	.34	- .35
Ceresine Wax	lb.	.14	- .26
Chlorowax 40	lb.	.13	- .15
Contogum	lb.	.06¼	- .10¼
CTLA Polymer	gal.	.17½	- .32½
Cumar Resins	lb.	.05½	- .14½
D.C. 200 Fluid	lb.	4.14	- 6.00
D.B.M.	lb.	——	- .30
Degras, Common	lb.	——	- .12
Diamylphenol (l.c.l., dms.)	lb.	——	- .28
Dibenzyl Sebacate	lb.	.74	- .76¾
Dibutoxethyl Sebacate	lb.	——	- .563⁄4
Dibutyl Phthalate	lb.	.29¼	- .32
Dibutyl Sebacate—Tech.	lb.	.59	- .61¾
C.P.	lb.	.61	- .63½
Dicapryl Adipate	lb.	.40½	- .43¼
Dicapryl Phthalate	lb.	.37	- .39¾
Dicaryl Sebacate	lb.	.61½	- .64¼
Di-Carbitol Phthalate (dms.)	lb.	.41½	- .42
Dicyclohexyl Phthalate	lb.	——	- .42
Diethyl Phthalate (t.c.)	lb.	——	- .24
Di-2-ethlyhexyl Phthalate (t.c.)	lb.	——	- .37
Dihexyl Adipate	lb.	.33	- .35¾
Dihexyl Phthalate	lb.	.28½	- .31¼
Dihexyl Sebacate	lb.	.50	- .52¼
Di Isobutyl Azelate (dms.)	lb.	.54	- .57
Di-iso-octyl Adipate (dms.)	lb.	.40¼	- .43¾
Di-iso-octyl Phthalate (t.c.)	lb.	.37	- .39¾
Dimethyl Phthalate (t.c.)	lb.	——	- .23
Dimethyl Sebacate	lb.	.77	- .79¾
Dioctyl Phthalate (dms.)	lb.	.37	- .39¾
Dioctyl Sebacate (dms.)	lb.	.62½	- .65¾
D.I.O.P. (dms.)	lb.	.36	- .38½
Dipolymer Oil	gal.	.33	- .38

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PLASTICIZERS & SOFTENERS (Cont'd)

Dispersing Oil No. 10	lb.	.05½	.05¾
Dutrex B	lb.	.02¾	.0334
5 and 6	lb.	.020	.031
15E	gal.	.10	.20
20, 21, 22 and 25	lb.	—	.04
ELA	lb.	—	.80
Elastex 10-P	lb.	.40	.42½
50-B	lb.	.34½	.37
DCHP	lb.	.42½	.43½
Estac	**lb.**	—	**.16**
Ethox (dms.)	lb.	.41½	.42
Flexol B-400	lb.	.27	.29
DHP	lb.	.35	.37½
DOP	lb.	.37	.39½
TOF	lb.	.41½	.44
3GH	lb.	.42	.44
3GO	lb.	.51¾	.53½
4GO	lb.	.36	.38½
8HP	lb.	.38	.40¾
Galex W-100	**lb.**	**.13½**	**.15**
G. B. Light Process Oil	lb.	.025	.0325
G. B. Naphthenic Neutrals	gal.	.11	.18
Good Rite GP233	gal.	.41½	.44½
GP261	gal.	.37	.3934
Harflex 500 (dms.)	lb.	.36½	.39¼
Hercolyn (dlvd.)	lb.	.16	.16½
Herron H.T.	gal.	.16	.27
Herron-Plas	lb.	—	.0334
Herron-Wax	lb.	.05¾	.06
No. 23	lb.	.0834	.0834
No. 24	lb.	.0714	.0714
HSC No. 13	lb.	.27	.30
Hylene B	lb.	.45	.50
C	lb.	.41	.46
D	lb.	.4714	.5214
Indonex 632½ (633¾, 634½, 638½)	gal.	.1100	.1700
Kapsol	lb.	.35½	.36
Kenflex	lb.	.23	.27
KP 23 (dms.)	lb.	.31½	.3234
70 (dms.)	lb.	.34	.3434
120 (dms.)	lb.	.37½	.38
140 (dms.)	lb.	.45½	.46
150 (dms.)	lb.	.29	.30
201	lb.	.41½	.42
Kremol 40	gal.	.36	.46
50	gal.	.36	.46
Kronisol (drums)	lb.	.35	.35½
Kronitex (drums)	lb.	.31½	.32½
Lanolin, Tech. Anydrous	lb.	.21	.23
Lead Oleate	lb.	—	.30½
Lindol (dms.)	lb.	.34	.35
2-Mercaptoethanol (drums)	lb.	—	.75
Methox (dms.)	lb.	.36½	.37
Methyl Laurate	**lb.**	**.25**	**.27**
Methyl Oleate	**lb.**	—	**.20**
Methyl Stearate (dms.)	lb.	—	.30
Modicol G	lb.	—	.23
R	lb.	—	.17
Montan Wax, Crude	lb.	.15	.18
Montan Wax	lb.	.12	.13
Monty Wax	lb.	—	.30½
Morflex No. 100	lb.	.37	.38½
Natrac	lb.	.10	.11
Neolene 210 (t.c.)	**lb.**	—	**.16**
212 (t.c.)	**lb.**	—	**.14**
220 (t.c.)	**lb.**	—	**.15**
Nerium	**lb.**	—	**.09**
Nevillac Resins (dms.)	lb.	.23	.45
Neville Resins (dms.)	**lb.**	**.10½**	**.15½**
Nevindene Resins (dms.)	lb.	.12½	.15½
Nevinol (dms.)	lb.	—	.17
Nevoil	gal.	.0214	.0334
Nevoxy 10 (dms.)	lb.	.0834	.1034
Nuba 1 (and 2) (dms.)	**lb.**	—	**.04**
3X (dms.)	lb.	.05¾	.0634
15 (and 30) Oil (dms.)	lb.	—	.2214
No. 480 Oil Proof Resin	lb.	—	.16
Ohopex Q10 (dms.)	lb.	.36½	.3714
Opalwax	**lb.**	**.37**	**.38**
Ortho-Nitrobiphenyl	**lb.**	**.06**	**.11**
Ozokerite Wax No. 64			
White	lb.	.31	.32
Yellow	lb.	.25	.26
P-1 (and 4)	lb.	—	.29
P-4C	lb.	—	.3814
P-8	lb.	—	.28
P-75	lb.	.66	.72
Pale 4 (and 1000)	lb.	.27	.2834
Palm Oil	lb.	—	.11
Paradene Resins (dms.)	lb.	.05	.06
Para Flux (dms.)	gal.	.1825	.1925
2016 (dms.)	gal.	.22	.23
Para Lube (t.c.l.)	**lb.**	**.046**	**.048**
Parmo	**lb.**	**.06**	**.13½**
Pepton 22	**lb.**	**.72**	**.75**
PG-16 (drums)	**lb.**	—	**.23½**
Picco 10 (and 25)	lb.	—	.1214
75 (and 100)	lb.	—	.12
Rubber Resin 100	lb.	.1314	.14
S.O.S.	gal.	.29	.34
Piccocizer 30	**lb.**	**.05½**	**.06**
Piccolastic A (and B, C, D, E)	lb.	.26	.2634
FF, FHF and FX	lb.	.1610	.1660
T-115	lb.	.2014	.2114
Picolyte S Resins	lb.	.1514	.1614
Piccolyte WW Resins	**lb.**	**.45**	**.47**
Piccoumaron Resins	lb.	.0514	.14
Piccovar	lb.	.1314	.14
Piccovol	**lb.**	**.02½**	**.04**
Pictar	**gal.**	**.25**	**.30**
Pigmentar	lb.	.0410	.0534

PLASTICIZERS & SOFTENERS (Cont'd)

Pigmentaroil	lb.	.0410	.0534
Plastac M	**lb.**	—	**.09¼**
Plasticizer 2286	lb.	—	.2614
Plasticizer SC	**lb.**	.49	**.52**
Plasticizer VA-1	**lb.**	—	**.40**
Plasticizer W-13	lb.	.37	.3834
Plasticizer XP-3	**lb.**	—	**.50**
Plastoflex 50	lb.	.26½	.29
52	lb.	.31	.32½
VS	lb.	.40	.42½
Plastogen	lb.	.0734	.08
Plastolein 9050 (c.l.)	lb.	—	.48
9055	lb.	—	.39
9058	lb.	—	.47
9250	lb.	—	.31
9715	lb.	—	.38
9720	lb.	—	.3014
Plastone	lb.	.27	.30
Polycin 781	lb.	—	.24
Polymel C-128	lb.	.1934	.2014
D	lb.	.22	.24
H-2	lb.	.22	.24
6	lb.	.0614	.10
7	gal.	.23	.28
Process Oil C-255 (c.l.)	gal.	—	.22
Propylene Stearate (dms.)	lb.	—	.32
PT 400 Pine tar (600, 800) (t.c., dms.)	lb.	.0387	.0511
PX-104	lb.	.34	.42
PX-108	lb.	.38	.46
PX-208	lb.	.4114	.49
PX-404	lb.	.60	.68
Reogen	lb.	.1134	.12
465 Resin (drums)	lb.	.05	.0514
Resin 731-C	cwt.	—	13.50
Resin C	lb.	.0200	.0285
Resinex	lb.	.0334	.0334
L-4	lb.	.0214	.03
Rexflex	lb.	—	.15
Ridbo 369 (drums)	lb.	.08	.09
369-F (drums)	lb.	—	.12
Rosin Oil	gal.	.54	1.20
R.P.A. No. 2	lb.	—	.65
No. 3	lb.	—	.46
No. 5	lb.	—	.57
R.S.O. Softening Oil	lb.	.03	.05
Rubberol	gal.	—	.2114
Rubtar	gal.	—	.40
Santicizer B-16	lb.	.50	.52
E-15	lb.	.47	.49
M-17	lb.	.44	.46
No. 107	lb.	.40	.4214
No. 140	lb.	.29	.31
No. 141	lb.	.40	.4214
No. 160	lb.	.34	.36
Sherolatum	lb.	.0234	.0514
Sherosope F and F445	lb.	.1634	.1814
L	lb.	.1714	.19
N	lb.	.1714	.1834
T	lb.	.1634	.1814
Softener No. 20	gal.	.09	.25
S.P.C.	lb.	—	.1914
Staflex 1XA	lb.	.34	.36
Stanolind Petrolatum	lb.	.037	.081
Wax	lb.	.25	.30
Stavelite Resin (dms.)	cwt.	—	9.00
Sunny South Burgundy Pitch	lb.	.0843	.0888
Sunny South Pine Tar	lb.	.0350	.0473
Sunny South Rosin Oil	gal.	.50	.66
Superla Wax	lb.	.25	.30
Syncera Wax	lb.	.175	.225
Synplasticizer	lb.	—	.10
Syn Tac (c.l.)	gal.	—	.53
Tar, Refined	gal.	.12	.17
K-Tarnel NR (t.c.)	lb.	—	.0851
Terpene A	gal.	—	.65
TP-90B	**lb.**	—	**.65**
TP-95	**lb.**	—	**.55**
TP98	lb.	—	.50
Triacetin	**lb.**	.34	**.45**
Tricresyl Phosphate	lb.	.30	.3214
Turgum S	lb.	.0834	.0934
Vanadiset A	gal.	.13	.20
Vistac No. 1	gal.	1.00	1.16
No. 2 (c.l.)	gal.	1.22	1.26
No. 4 (c.l.)	gal.	1.32	1.36
P	lb.	—	.17
Witresin—Granular	**ton**	**41.00**	**43.00**
Solid	ton	36.00	38.00

PROCESSING AIDS

Castor Oil, Processed (dms.)	lb.	—	.2214
Refined (drums)	lb.	—	.2014
Castorwax (min. 250 lbs.)	lb.	—	.2814
Dutrex 7	lb.	.12	.20
Millrex	**lb.**	—	**.15**
Resin No. 510	lb.	.1314	.1614
Zyrox	lb.	.50	.79

PROTECTIVE & STABILIZING AGENTS

Acacia	lb.	1234	.21
Alpha Protein	lb.	.24	.28
Ammonium Alginate	lb.	—	.95
Aroostoocrat	lb.	—	.0714
Carob Bean Flour	lb.	—	.46
Casein	lb.	.28	.38
Ethylene Diamine 68%	lb.	.57	.58
Karaya Gum	lb.	.20	.50
Prosen	lb.	.0600	.0630
Rex Compound No. 2801	lb.	—	.15
Stablex B	lb.	.50	.95
K	lb.	.27	.35
Tragacanth Flakes	lb.	.60	1.35

RECLAIMING AGENTS

Armeens C	lb.	.50	.58
T	**lb.**	**.42**	**.50**
No. 517 H.B. Oil	**gal.**	**.11½**	**.16½**
535	gal.	.22	.27
C-6 Oil (and 28, 32)	gal.	.33	.38
C-10 Oil	gal.	.25	.30
C-33 Oil	gal.	.17¼	.2234
Caustic Soda—Flake 76% (c.l., drums)	cwt.	—	3.60
Liquid 50% (t.c.)	**cwt.**	—	**2.40**
Solid 76% (c.l., dms.)	cwt.	—	3.20
Cresylic Acid (99-100%)	gal.	1.55	1.69
D-4	gal.	.23	.28
E-5	gal.	.21	.26
G. B. Reclaiming Oil	gal.	.12	.18
Heavy Aromatic Naphtha (t.c.)	gal.	—	.1214
LX-77 Reclaiming Solvent	gal.	.21	.30
LX-572 Reclaiming Oil	gal.	.23	.28
Neo-Fat D-242	**lb.**	**.05½**	**.07¼**
PRR 1	gal.	.15	.35
PT 67 Light pine oil	gal.	—	.50
PT 101 Pine tar oil	lb.	.0387	.0511
Q Oil	gal.	.246	.296
Reclaiming Oil 1621	lb.	.03	.04
Reclaiming Oil 3186 (t.c.)	gal.	.28	.3814
Reclaiming Oil 3186 G.	gal.	.25	.3614
Reclaiming Reagent No. 4	lb.	.12	.15
R.P.A. No. 3	lb	—	.46
Soda Ash (c., bags)	**cwt.**	—	**1.40**
Solvengl 1 (dms.)	gal.	—	.36
Solvent 534	gal.	.2014	.2614
Solvent Oil 21	gal.	.24	.29
C-42	gal.	.23	.28
Union Solvent 4060-O	gal.	—	.147
X-1 Resinous Oil	lb.	.0190	.0285
X-60 Solvent	gal.	.24	.32

REINFORCING AGENTS—CARBON BLACK

Channel, Hard Processing (HPC) (bags)

Atlantic HPC-98	lb.	.0740	.1225
Continental F	lb.	.0740	.1225
Croflex	lb.	.0740	.1225
Crow	lb.	.0740	.1225
Dixiedensed (and S)	lb.	.0740	.1225
Kosmobile (and S)	lb.	.0740	.1225
Kosmos T	lb.	.0740	.1225
Micronex HPC	lb.	.0740	.1225
Spheron 4	lb.	.0740	.1225
Witco Dispers'o No. 6	lb.	.0740	.1225

Channel, Medium Processing (MPC) (bags)

Atlantic MPC-95	lb.	.0740	.1225
Continental A	lb.	.0740	.1225
Croflex TH	lb.	.0740	.1225
Dixie R-1	lb.	.0740	.1225
Dixiedensed HM (and S-66)	lb.	.0740	.1225
Huber Arrow TX	lb.	.0740	.1225
Kosmobile HM (and S-66)	lb.	.0740	.1225
Kosmos M	lb.	.0740	.1225
Micronex Standard	lb.	.0740	.1225
Spheron 6	lb.	.0740	.1225
Texas M	lb.	.0740	.1225
Witco Dispers'o No. 1	lb.	.0740	.1225

Channel, Easy Processing (EPC) (bags)

Atlantic EPC F-42	lb.	.0740	.1225
Continental AA	lb.	.0740	.1225
Croflex 77	lb.	.0740	.1225
Dixiedensed 77	lb.	.0740	.1225
Kosmobile 77	lb.	.0740	.1225
Micronex W-6	lb.	.0740	.1225
Spheron 9	lb.	.0740	.1225
Texas E	lb.	.0740	.1225
Witco Dispers'o No. 12	lb.	.0740	.1225
Wyex	lb.	.0740	.1225

Channel, Conductive (CC) (bags)

Dixie 5 Dustless	lb.	.0868	.1425
Kosmink dustless	lb.	.0868	.1425
Spheron C	lb.	.1200	.1600
Spheron N	lb.	.2300	.2800
Voltex	lb.	.1800	.2150

Furnace, Fast Extruding (FEF) (bags)

Dixie 50	lb.	.0600	.1000
Kosmos 50	lb.	.0600	.1000
Statex M	lb.	.0600	.1000

Furnace, High Modulus (HMF) (bags)

Continex HMF	lb.	.0525	.0975
Dixie 40	lb.	.0550	.0950
Kosmos 40	lb.	.0550	.0950
Modulex	lb.	.0550	.0950
Statex 93	lb.	.0550	.0950
Sterling L	lb.	.0550	.0950
Sterling SO	lb.	.0600	.1000

Furnace, Medium Abrasion (MAF) (bags)

Philblack A	lb.	.0600	.1000

Furnace, Reinforcing (RF) (bags)

Dixie 60	lb.	.0790	.1175
Kosmos 60	lb.	.0790	.1175

Furnace, Semi-Reinforcing (SRF) (bags)

Continex SRF	lb.	.0400	.0800
Dixie 20	lb.	.0400	.0800
Essex	lb.	.0400	.0800
Furnex	lb.	.0400	.0800
Gastex	lb.	.0400	.0800
Kosmos 20	lb.	.0400	.0800
Pelletex	lb.	.0400	.0800
Sterling NS	lb.	.0400	.0800
Sterling R	lb.	.0450	.0800
Sterling S	lb.	.0400	.0800

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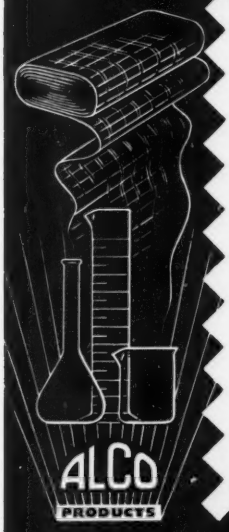

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REINFORCING AGENTS—CARBON BLACK (Cont'd)

Furnace, Fine (FF) (bags)

Statex B	lb.	.0650 -	.1050
Sterling 99	lb.	.0600 -	.1050

Furnace, High Abrasion (HAF) (bags)

Aromex	lb.	.0790 -	.1250
Philblack O	lb.	.0790 -	.1190
Statex R	lb.	.0790 -	.1250
Vulcan 3	lb.	.0790 -	.1220

Furnace, Very Fine (VFF) (bags)

Statex K	lb.	.0790 -	.1250

Thermal, Fine (FT) bags)

P-33 (c.l.)	lb.	— -	.0500

Thermal, Medium (MT) (bags)

Thermax (c.l.)	lb.	— -	.0325
Thermax, Stainless (c.l.)	lb.	— -	.0400

REINFORCING AGENTS—SILICA

Hi-Sil	lb.	.11 -	.12½

REINFORCING AGENTS—MISCELLANEOUS

Darex Copolymer No. 3	lb.	.42 -	.44
X34	lb.	.37 -	.39
X43 (and 43E)	lb.	.38 -	.40
Darex Copolymer Latex No. 3 (and X34)	lb.	.36½ -	.50
Durez 12687 (and 12707)	lb.	— -	.32
Durez 13355	lb.	— -	.26
Good-Rite Resin 50	lb.	.36 -	.38
Kralac A	lb.	.39 -	.40
Marbon S and S-1	lb.	.36 -	.43
8000	lb.	.38 -	.45
Marmix	lb.	.36 -	.43
Pliolite Latex 190	lb.	.30 -	.34
Pliolite NR	lb.	.74 -	.76
Pliolite S6 (and S6B) Resin	lb.	.36 -	.37
C-3 Masterbatch	lb.	.47 -	.48
C-4 Masterbatch	lb.	.45 -	.46
G Masterbatch	lb.	.35 -	.36
G50 Masterbatch	lb.	.35 -	.36
N Masterbatch	lb.	.40 -	.41
R Masterbatch	lb.	.43 -	.44
Polyco 220	lb.	.13 -	.15

RETARDERS

Dutch Boy Normasal	lb.	— -	.43½
ESEN	lb.	— -	.36
Retarder ASA	lb.	— -	.55
Retarder PD	lb.	.34 -	.36
Retarder W	lb.	— -	.43
Retardex	lb.	.47 -	.50

RUBBER SUBSTITUTES

Mineral Rubber

38	ton	38.00 -	40.00
Black Diamond	ton	38.00 -	40.00
Byerlyte	ton	47.00 -	54.00
Gilsonite, Selects (c.l.)	ton	33.50 -	36.00
Hard Hydrocarbon (dms.)	ton	42.50 -	44.50
Herron Flake	ton	— -	45.00
Mineral Rubber, solid	ton	42.50 -	44.50
Pioneer	ton	35.00 -	46.00

Vulcanized Vegetable Oils (Factice)

Amberex	lb.	.28 -	.32
Brown	lb.	.1310 -	.1955
Dispersed	lb.	.22 -	.42
Neophax	lb.	.16 -	.24
White	lb.	.13 -	.24

Miscellaneous Rubber Substitutes

G.B. Asphaltenes	lb.	.06 -	.06½
Gilsowax B	lb.	.09 -	.11
Resin No. 1098 (drums)	ton	— -	.62
No. 1198	lb.	.46¾ -	.49¾

SOLVENTS

Acetone (dlvd.)	lb.	.08½ -	.11
American Dipentine	gal.	.36 -	.39
American Pine Oil	gal.	.71 -	.72
Amsco Lactol Spirits (t.c.)	gal.	— -	.17
Rubber Solvent (t.c.)	gal.	— -	.16
Solv A (t.c.)	gal.	— -	.21½
Solv A-80 (t.c.)	gal.	— -	.26
Solv B (t.c.)	gal.	— -	.25
Solv B-90 (t.c.)	gal.	— -	.28½
Solv D (t.c.)	gal.	— -	.25¾
Special Naphthalite (t.c.)	gal.	— -	.16
Textile Spirits (t.c.)	gal.	— -	.17
Amyl Chlorides, Mixed (t.c.l.) (drums)	lb.	— -	.08
Aromatic Solvent 40	gal.	— -	.219
Benzol 90%	gal.	.17 -	.24
Butyl Acetate (t.c.)	lb.	.13 -	.175
Butyl Alcohol (t.c.)	lb.	.13 -	.175
Secondary (dlvd.)	lb.	.10 -	.12½
Tertiary (dlvd.)	lb.	12 -	.14½
Carbon Bisulfide, Tech.	lb.	.0440 -	.0800
Carbon Tetrachloride	lb.	.08 -	.08½
Cosol 1	gal.	.30 -	.38
Cosol 2	gal.	.30 -	.38
Cyclohexane	lb.	.09¼ -	.11¾
Cyclohexanone	lb.	.25 -	.27 *
Diacetone, Pure (dlvd.)	lb.	.12 -	.14½

SOLVENTS (Cont'd)

Dichlorethyl Ether (dms.)	lb.	.165 -	.17
Formal (dms.)	lb.	.265 -	.27
Dichloropentane (t.c.l.)	lb.	.04 -	.05½
Dicon	gal.	.30 -	.42
Dipentene 122 (dms.)	gal.	.35 -	.36
Halowax Oil	lb.	.25 -	.37
Heptanes (t.c.)	gal.	.17 -	.22
Hexalin Cyclohexanol	lb.	.20 -	.22 *
Hexanes (t.c.)	gal.	.17 -	.22
Isopropyl Alcohol, Ref. 99% (dlvd.)	gal.	.40 -	.57
Ether, Ref. (dlvd.)	gal.	.04½ -	.07
Mesityl Oxide (dlvd.)	lb.	.11¾ -	.14
Methyl Acetone, Syn. (drums, dlvd.)	gal.	.615 -	.65
Methyl Ethyl Ketone	lb.	.10 -	.12½
Methyl Isobutyl Ketone (dlvd.)	lb.	.12 -	.14½
N-5 Pentane Mix. (t.c.)	gal.	— -	.13½
N-6 Hexanes (t.c.)	gal.	— -	.14
N-7 Hexanes (t.c.)	gal.	— -	.13
Petrolene (t.c.)	gal.	— -	.11125
Picolines, Aplha, Refined	lb.	.75 -	1.00
Mixed	lb.	— -	.45
Proprietary Alcohol (t.c.)	gal.	— -	.43½
Pyridine, Refined	lb.	.80 -	.89
Quinoline	lb.	.50 -	.60
Rubber Solvent (t.c.)	gal.	— -	.16
Rubsol (t.c.)	gal.	— -	.11875
Skellysolve B (Hexanes) (t.c.)	gal.	— -	.148
C (Heptanes) (t.c.)	gal.	— -	.141
E (Octanes) (t.c.)	gal.	— -	.155
R (Solvent Naphtha)	gal.	— -	.114
Solvenol (dms.)	gal.	— -	.36
Solvent, Crude, Light	gal.	.19 -	.28
Solvesso 100 (t.c.)	gal.	— -	.28
150 (t.c.)	gal.	— -	.28
Sunny South Dipentene	gal.	.39 -	.39
Sunny South Pine Oil	gal.	.71 -	.72
Toluene (drums)	gal.	— -	.28
Toluol (t.c.)	gal.	— -	.30
Trichlorethane	lb.	.11 -	.12
Triglycol Dichloride (dms)	lb.	.53 -	.54
Tromex	lb.	.078 -	.083
Union Thinner 1	gal.	— -	.161
3	gal.	— -	.161
7	gal.	— -	.151
2-50-W Hi-Flash	gal.	— -	.38
X-7 Sp. Heptanes (t.c.)	gal.	— -	.11

STABILIZING AGENTS (for Vinyl Resins)

Basic Silicate White Lead	lb.	.16¼ -	.17¾
No. 201	lb.	.21¾ -	.22¾
BVS	lb.	— -	.60
Cadmium Stearate	lb.	— -	1.25
Dutch Boy DS-207	lb.	— -	.53
Plumb-O-Sil A	lb.	— -	.30½
B	lb.	— -	.31¾
Tribase	lb.	— -	.27½
Dythal	lb.	— -	.40½
Lead Stearate, Precip.	lb.	.36 -	.38
Fused	lb.	— -	.35½
Lithium Stearate	lb.	.63 -	.65
Stabelan E	lb.	1.25 -	1.40
XL	lb.	.55 -	.65
Stabilizer No. 3	lb.	— -	2.00
Stabilizer No. 21	lb.	— -	.90
Stabilizer No. 52	lb.	— -	2.00
Stabilizer E6B	lb.	— -	.85
Stabilizer JCX	lb.	— -	.49
Stabilizer L	lb.	— -	.60
Stabilizer SN	lb.	— -	.42
Stabilizer V-1-N	lb.	— -	.50
Stabilizer V-9	lb.	— -	.85
Stabilizer V-7939	lb.	— -	.60
Vanstay	lb.	.33 -	.35

STIFFENING AGENTS

Calco S. A.	lb.	.80 -	.83

SUN CHECKING AGENTS

Antisol	lb.	— -	.23
Antisun	lb.	— -	.21
Heliozone	lb.	.25 -	.26
Sharples Wax	lb.	.23 -	.28
Sunolite	lb.	.20 -	.23
Sunproof	lb.	.25 -	.26
Imp.	lb.	.23 -	.24
Jr.	lb.	.18 -	.19
Tonox	lb.	.50 -	.52

TACKIFIERS

Advaresin 100	lb.	.13½ -	.14
Arcco 493-49B	lb.	.15 -	.17
700-25A	lb.	.14 -	.16
U2-24	lb.	.13 -	.13
Beckopol 1400 (dlvd.)	lb.	.25½ -	.26
Galex (druma)	lb.	— -	.15
Indopol H-300 (bbls.)	gal.	1.12 -	1.16
Koresin	lb.	.73 -	.75
Nilox	cwt.	12.50 -	13.50
Pentalyn A (dlvd.)	lb.	.12½ -	.13
Resin V	lb.	— -	.23¼
Rubtack	lb.	— -	.12
Staybelite Ester No. 10 (dlvd.)	lb.	.19¾ -	.20¼
Super-Beckacite No. 1001 (dlvd.)	lb.	.34 -	.34½
Synthol	lb.	— -	.20½
Vistac No. 1	gal.	1.00 -	1.16
No. 2 (c.l.)	gal.	1.22 -	1.26
No. 4 (c.l.)	gal.	1.32 -	1.36
A	lb.	— -	.20¼
Zirex	cwt.	12.00 -	12.80

THICKENERS (FOR LATEX)

Alcogum AN-6	lb.	— -	.08
AN-10	lb.	— -	.08½
Betanol (drums)	lb.	— -	.70
Emulsorex No. 5	lb.	— -	.35
Lecithin	lb.	.12 -	.17
Modicol VD	lb.	— -	.12½
VE	lb.	— -	.10⅞
VF	lb.	— -	.10⅞
VK	lb.	— -	.07
Polyco 296	lb.	.13 -	.13½
Propylene Laurate (dms.)	lb.	.57 -	.67
Sodium Silicate	cwt.	1.50 -	2.65

VULCANIZING AGENTS

Selenium

Ancasal*	lb.	— -	2.00
Vandex	lb.	— -	2.25

Sulfur

Blackbird	cwt.	— -	2.30
Crystex	lb.	.19½ -	.23
Darex Dispersed Sulphur	lb.	.12 -	.17
Dispersed Sulfur	lb.	.12 -	.17
Devil (c.l.)	cwt.	— -	1.75
Insoluble Sulfur 60	lb.	.13 -	.13½
Spider	cwt.	— -	2.30
Star (c.l.)	cwt.	— -	2.25
Tire (c.l.)	cwt.	— -	1.75
Tube	cwt.	— -	2.25

Tellurium

Ancatel*	lb.	— -	2.00
Latex Telloy	lb.	— -	2.00
Telloy	lb	— -	2.00

WASHING & FINISHING AGENTS

Aycolene (t.c.)	gal.	— -	.12375

WETTING AGENTS

Advawet No. 10	lb.	— -	.35
No. 15	lb.	— -	.20½
No. 33	lb.	— -	.39
Aerosol OT 70% Clear	lb.	.80 -	1.00
Alrosol (dms.)	lb.	— -	.40
Alrosperse	lb.	— -	.18
Aquarex D	lb.	— -	.76
MDL Paste	lb.	— -	.30
ME	lb.	— -	.92
NS	lb.	— -	.60
WA Paste	lb.	— -	.25
Areskap 50	lb.	.30 -	.38
Dry 100	lb.	.60 -	.72
Aresket 240	lb.	.30 -	.38
Dry 300	lb.	.60 -	.72
Aresklene 375	lb.	.42 -	.57
Dry 400	lb.	.70 -	.84
Armacs	lb.	.29 -	.76
Arquads	lb.	.21 -	.61
Etho-chemicals	lb.	.34 -	.80
Lecithin	lb.	.18 -	.26
Modicol L	lb.	— -	.58
N	lb.	— -	.40
S	lb.	— -	.22
Nopco 1086-A	lb.	.42 -	.50
1187-X	lb.	— -	.14½
Parnol	lb.	.13 -	.18
Santomerse D	lb.	.43 -	.65
S	lb.	.12 -	.25
Sorbit P	lb.	— -	.25
Stablex G	lb.	.50 -	.70
Tergitol 4 (dms., dlvd.)	lb.	— -	.30
7 (dms., dlvd.)	lb.	— -	.37
08 (dms., dlvd.)	lb.	— -	.30
P28 (dms., dlvd.)	lb.	— -	.19
Trenamine W-30	lb.	— -	.15
Vultamol	lb.	— -	.17½
Wetsit Conc.	lb.	.25 -	.32

MISCELLANEOUS CHEMICALS

Acto 450 (550-W, 600, 630)	lb.	.109 -	.145
Agchem SA-17	lb.	— -	.29
Aquarex SMO	lb.	— -	.50
A.S.T.M. Oil No. 1 (and No. 3)	gal.	1.00 -	1.15
Copper Inhibitor X-872-L	lb.	— -	1.95
D-Tac	lb.	.21 -	.23
2-Ethylhexanol (dms.)	lb.	.25 -	.26
Glycerine, 88% Sap., Crude (dlvd.)	lb.	.25 -	.25½
MODX	lb.	.295 -	.345
NBC	lb.	— -	1.50
Para Resin No. 2457 (c.l.)	lb.	— -	.04
No. 2718 (c.l.)	lb.	— -	.04
Pigmented Filmite	lb.	— -	1.00
Polyvinyl Methyl Ether	lb.	— -	1.00
Reference Fluid SR-6	gal.	.85 -	1.00
SR-10	gal.	.60 -	.75
Resin No. 1226	lb.	.31½ -	.36½
Rio Resin	lb.	.52 -	.54
RR-10	lb.	— -	.35
Santocel	lb.	— -	.50
Sherosope L, N, F-445 and P	lb.	.12½ -	.15
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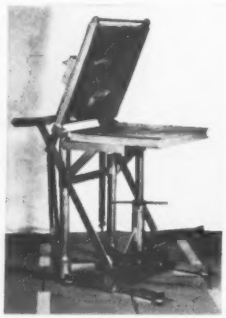

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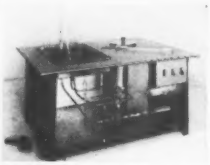

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